Marine and Freshwater Beach Testing in Massachusetts

Annual Report
2007 Season

Prepared by

Massachusetts Department of Public Health
Bureau of Environmental Health
Environmental Toxicology Program

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I. INTRODUCTION

A. OVERVIEW

Massachusetts has an extensive collection of recreational waters, including both freshwater and marine bathing beaches. These beaches serve as recreational resources to the local communities, and bathing beach water quality is an important public health concern. It is of vital importance to ensure that the beaches meet all current public health standards. Recreational use of waters polluted by microbial contamination can result in human health problems such as sore throat, gastroenteritis, or even meningitis or encephalitis (Cabelli, 1983; USEPA, 1986; Cabelli, 1989; Haile, 1996; Pruss, 1998). As a result, beach water quality is regulated to protect public health. In Massachusetts, bathing beach water quality is regulated by the Massachusetts Department of Public Health (MDPH) under Massachusetts General Law (MGL) Chapter (C) 111, § Section (S)5 and regulations cited as 105 Code of Massachusetts Regulations (CMR) 445.000: Minimum Standards for Bathing Beaches (State Sanitary Code, Chapter VII; Appendix A and B). All public and semi-public (e.g., campgrounds, motels) bathing beaches in Massachusetts must be monitored for bacterial, and on occasion environmental, contamination during the bathing season. The bathing beach season in Massachusetts runs from as early as Memorial Day in some areas, through Labor Day during most years. Beach operators are able to determine their own bathing beach season based on their operating schedule. The majority of beaches begin operation after schools are released for the summer in mid-June and conclude before Labor Day.

Local boards of health (BOH), the Barnstable County Department of Health and the Environment, and the Massachusetts Department of Conservation and Recreation (MDCR) conduct the vast majority of beach water sampling in Massachusetts. Most marine beach samples are analyzed at MDPH Bureau of Environmental Health (BEH) contracted laboratories. Most freshwater samples are analyzed at private laboratories, while some are analyzed at municipal facilities.

Bathing water samples that are found to contain levels of bacterial contamination in excess of regulatory standards are termed exceedances. If water samples from a beach are found to be in exceedance of regulatory standards, the beach must be posted as

unsafe for swimming due to bacterial contamination. The general public is notified of a beach posting via signs posted at access points to that beach. For marine beaches, the general public is also notified via the MDPH/BEH website, which is operated in collaboration with local health officials and MDPH contract laboratories. Local health officials and MDPH/BEH contract laboratories collect and analyze the samples and perform a majority of the data entry onto the website. MDPH/BEH is notified of exceedances within 24 hours (105 CMR 445.040). Beaches are to remain posted until the levels of bacterial contamination decrease to safe levels, at which point the postings can be removed and MDPH/BEH is notified of the beach reopening.

The Massachusetts Beaches Act (Appendix C), which was passed in 2000, requires all public and semi-public beaches to be tested during the beach season using standard bacterial indicators. The act mandated that testing occur either weekly or on a less or more frequent basis per MDPH and the local board of health. In 2000, the U.S. Congress enacted the Beaches Environmental Assessment and Coastal Health (BEACH) Act that amended the Federal Water Pollution Control Act (commonly referred to as the Clean Water Act, or CWA) to improve the quality of coastal recreational waters (Appendix D). The BEACH Act seeks to reduce the risk of illness to users of the nation's marine recreational waters through the identification of high-risk beaches, identification and mitigation of sources of pollution, and notification/risk communication to the public. It also authorizes grants to eligible states to support these objectives.

Since late 2001, MDPH/BEH has received funding from the United States Environmental Protection Agency (USEPA) that partially supports MDPH efforts to (1) develop and maintain an inventory of marine bathing beaches, (2) compile and analyze monitoring data, and (3) to conduct assessments of those beaches identified as high-risk. Based on work through the MDPH/BEH Beaches Project, MDPH/BEH has been able to make several major accomplishments in support of these goals:

Bathing Beaches Inventory

Prior to 2001, MDPH/BEH conducted a survey of Massachusetts municipalities in order to initiate the establishment of an inventory of all public and semi-public marine and freshwater beaches. Through the collection of beach water data and contacts with local boards of health, beach managers, and others, MDPH/BEH has a documented inventory

of over 500 marine and over 600 freshwater public and semi-public beaches. The inventory is updated continually to beach name and location changes. A comprehensive inventory of public freshwater beaches is planned to be completed in 2008 by MDPH/BEH staff in order to expand the list of known beaches.

Bathing Beaches Mapping Project

In 2003, a detailed geographic information system (GIS) layer for Massachusetts marine bathing beaches was developed by MDPH/BEH with assistance from Applied Geographics, Inc. (AGI), and with considerable input from local health officials. State health officials, working with local health officials, identified the locations and specific boundaries of each known beach, the designations of each beach – public or semi-public (and private if known), the location or locations where the water samples are taken from for routine monitoring, the location at each beach where posting (i.e., closure due to bathing water quality violation) would occur in the event it is necessary, and the locations of normal access points and parking lots. All information was validated by MDPH/BEH staff, who performed site visits to all marine beaches and converted this information into GIS beach layers by taking in-field readings.

Bathing Beaches Monitoring

MDPH/BEH has developed a bathing beaches monitoring database, which includes all reported beach monitoring data and related information. MDPH/BEH has been successful in monitoring every public marine beach and most semi-public marine beaches on a weekly basis during the past six beach seasons in Massachusetts. This includes 599 sampling locations at over 500 marine beaches.

Public Notification/Outreach

In 2001, MDPH/BEH initiated the development of a system that would enable the public to see which beaches were open or closed on any particular day, the reason behind any closure, and to keep track of a beach's water quality history. This electronic web-based system for public notification of marine beach postings and water quality monitoring data went online in 2003 and was developed by MDPH/BEH in conjunction with Garrison Enterprises. The website was developed with funding support from the USEPA BEACH

Grant and can be reached from the MDPH/BEH beaches website (http://www.mass.gov/dph/topics/beaches.htm) or directly at: http://mass.digitalhealthdepartment.com/public_21/index.cfm

The website allows for reporting of routine water quality monitoring data through a series of password protected data entry pages. The web-based system allows MDPH/BEH contract laboratories to enter sampling test results directly to the site. These laboratories are required under the MDPH/BEH contract to enter field sampling data and laboratory results into the public notification website as they become available. Data entered on the site provide as near real-time public notification as possible, after which the website automatically generates postings for those samples that exceed single-sample or geometric mean regulatory limits. Display of postings on the public pages occur twice per day, at 9:30 AM and 12:30 PM. Local health officials can view postings shortly before public notification in order to give them an opportunity to post beaches and prepare for public inquiries that may result depending on the most recent data. In 2006, the web-based system was enhanced to more clearly explain and illustrate the sampling results, for example by providing easy viewing of historical monitoring data, and to speed the entry and quality of data by laboratories that use the system. These improvements allow the public to quickly find the locations of all beaches through the use of the new GIS maps and provide for easy viewing of graphical and tabular historical monitoring data.

Quality Assurance

MDPH/BEH completed an updated Quality Assurance Project Plan (QAPP) in May 2007 that was subsequently approved by USEPA and distributed to contracted laboratories before the 2007 beach season. The QAPP describes the quality assurance, quality control, and related activities, including enforcement aspects that are in place to ensure the results of the project will meet USEPA's published performance criteria. It also includes details on approved laboratory methods, MDPH/BEH contacts, and website information.

In 2003, a Quality Management Plan (QMP) for all beaches activities under the USEPA BEACH grant and other activities specific to bathing beach regulations was also finalized. The QMP is a required document that describes how the program will develop,

implement, and determine the effectiveness of its quality assurance and quality control policies and procedures.

In 2004, the Data Submission Plan for Routine Monitoring under the USEPA BEACH grant and other activities specific to bathing beach regulations was developed, submitted to, and approved by USEPA. The Plan is a required document that describes Massachusetts' plan for submitting the beach data it collects from coastal municipalities to USEPA. USEPA then compiles data from all states to develop a national picture of this information.

Sanitary Surveys

MDPH/BEH has developed a sanitary survey form for beaches. The development of this form allows communities to apply for sampling variances according to Massachusetts' regulations (105 CMR 445.100) and helps MDPH/BEH to comply with USEPA BEACH Grant requirements for a tiered monitoring approach to sampling.

In 2003, MDPH/BEH developed the Public Health-Based Beach Evaluation, Classification, and Tiered Monitoring Plan in order to ultimately direct water quality monitoring resources to the beaches that pose the greatest health concerns. The plan is intended to facilitate the identification and clean up of pollution problems, while those beaches with more pristine records can be monitored less often than the required weekly routine monitoring through a variance process pursuant to both the Massachusetts and federal beach acts. In this system, every public and semi-public marine bathing beach was classified as "Tier One," "Tier Two," or "Tier Three." Tier One includes heavily used beaches which have pollution problems. USEPA believes that these beaches should be tested at least twice per week. Because of the ongoing pollution concerns/violations, those beaches are generally sampled more than once a week. There are currently seven Tier One beaches in Massachusetts. All of the Tier One beaches are marine beaches and are tested daily. Tier Two includes higher use beaches with some pollution. These beaches must be tested once per week. The majority of beaches (421 of the 521 marine and 544 of the 549 freshwater beaches) are categorized as Tier Two beaches. Tier Three beaches are those with no known pollution problems and are required to be tested once every two weeks or sometimes less frequently, as determined by the local board of health and MDPH/BEH through the variance process. There are 86 marine beaches and

5 freshwater beaches currently listed as Tier Three beaches. In 2006 and 2007, MDPH/BEH ETP beaches staff conducted sanitary surveys in 23 marine communities that had Tier Three eligible beaches.

Training

MDPH/BEH has held numerous training sessions for local health officials during the life of the BEACH Grant. In addition to training relative to conducting sanitary surveys, topics discussed have included: health concerns related to polluted bathing water, sampling methodology and use of standardized field sampling forms, current federal and state regulations, MDPH/BEH's public notification website and an overview of its GPS survey of marine beaches in Massachusetts. MDPH/BEH trainings have also presented information on identifying actual and/or potential sources of contamination. During the past year, additional technical guidance has been provided through mailings and personal communications to local health officials.

Laboratory Programs

MDPH/BEH has used portions of the federal beach funds to provide partial support for routine water quality monitoring at marine beaches in local communities that qualified. Since 2003, over 25,000 samples have been analyzed from over 50 marine beach communities who have taken part in the contract laboratory program.

In 2007, MDPH/BEH used BEACH grant funds to contract with four laboratories (i.e., Barnstable County Department of Health and Environment Water Quality Testing Laboratory, Town of Chatham Department of Health and Environment Water Quality Laboratory, Wampanoag Environmental Laboratory, and G&L Laboratories, Inc.) to process regular weekly samples for public, marine beaches in Massachusetts, and to electronically report the data directly to MDPH/BEH. The contract laboratories were successfully audited by MDPH/BEH ETP staff in 2005 to ensure compliance with the QAPP and Standard Operating Procedures. Local boards of health, as in the past, report all freshwater beaches data. This report presents the results and analysis of these 2007 data from Massachusetts marine and freshwater bathing beaches.

II. BACKGROUND

A. INFORMATION ON BEACH WATER QUALITY

1. Health Effects from Swimming in Marine Waters

Several prospective and retrospective epidemiological studies (Cabelli, 1983; USEPA, 1986; Cabelli, 1989; Haile, 1996; Pruss, 1998) have concluded that swimming in polluted marine water poses health risks to swimmers. This conclusion is based on the observation that there is an increased rate of adverse health effects among swimmers in marine waters as compared to non-swimmers. Swimming in polluted marine water can lead to gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea, abdominal pain), respiratory symptoms (e.g., sore throat, cough, chest cold, runny nose, sneezing), eye and ear symptoms (e.g., irritation, earache, itchiness), dermatological symptoms (e.g., skin rash, pruritis), and constitutional symptoms (e.g., fever, chills). One retrospective study found the relative risk of gastrointestinal illness among swimmers in polluted waters to be 1.0 to 3.0 times the risk of non-swimmers (Pruss, 1998). The epidemiological studies suggest that swimmers may be exposed to pathogens (illness-causing microorganisms) while swimming. More recent studies (Wade et al., 2003; Wade et al., 2006) have reaffirmed that there is a significant association between swimming in contaminated water and gastrointestinal illness. Pathogens in marine waters typically have a fecal source. Pathogens associated with human fecal matter (e.g., some strains of *Escherichia coli*) may be present in the water due to a variety of sources, including but not limited to ocean disposal of sewage by boats, sewage treatment plant outfalls, illegal sewage hookups, and combined sewer overflows. Bathers may also contribute significantly to pathogen concentrations in recreational waters (California, 1997; Gerba, 2000). Pathogens may be ingested or absorbed while swimming, thereby causing an increased risk of disease among swimmers relative to non-swimmers (Cabelli et al., 1982; Cabelli, 1983; Cabelli, 1989; Coye and Goldoft, 1989; CDC, 1990-2004; Corbett et al., 1993; Haile, 1996).

2. Beach Water Quality Testing Methods - Marine

The pathogens that cause swimming-associated disease are very difficult to measure directly. Furthermore, because of the wide variety of different pathogens that might be

present in marine waters, measuring all possible pathogens is not practical for routine testing programs. Therefore, public health officials typically estimate the potential for pathogens to be present in the water by testing the water for a microorganism or a group of microorganisms whose life cycle(s) mimics that of specific pathogens but which are easier to measure than the pathogens themselves. Because they indicate when pathogens are likely to be present, these microorganisms or groups of microorganisms are called “indicators” (Cabelli, 1983).

In the United States, concern about pathogens in marine waters typically has been centered around those pathogens associated with fecal contamination (Cabelli, 1983). As a result, methods commonly used in this country test for an indication of the degree of fecal contamination of the water. The most accurate indicators of fecal contamination are specific microorganisms (e.g., *Escherichia coli, Streptococcus faecalis,* or *Clostridium perfringens*) that are predominantly present in human and animal feces (Cabelli, 1983). Testing for a single indicator species, however, can fail to detect the presence of fecal pathogens if that indicator species does not survive in the natural environment for as long as the fecal pathogens themselves (NAS, 1977). Therefore, methods that test for groups of microorganisms, such as total coliforms, fecal coliforms, or Enterococci, are frequently used instead (Cabelli, 1983). These tests are usually easier and faster to perform than those that test for specific indicator species. In the case of Enterococci, they also strongly correlate with swimming-associated illnesses (USEPA, 1986; Pruss, 1998). One disadvantage of using groups of microorganisms as indicators is that these tests can falsely predict the presence of fecal contamination if organisms that are not associated with fecal contamination are detected by the method (NAS, 1977; Cabelli, 1983; Barrell et al., 2000). For public health purposes, however, it is prudent to respond to such indicators to prevent adverse health outcomes.

As of the year 2000, Enterococci are the required indicator organisms for determining levels of contamination at marine bathing beaches in Massachusetts. In the past, total coliforms and fecal coliforms were used as indicators for marine bathing beaches. In 2007, all marine beaches in Massachusetts that reported data used Enterococci as a routine monitoring indicator. The detection methods and criteria for Enterococci are described below. The methods and criteria for fecal coliform and total coliform are also included.

a) Enterococci Method

Similar to the total and fecal coliform methods, the Enterococci method detects the number of bacteria that grow under certain laboratory conditions (USEPA, 1985). However, the Enterococci method detects fewer total species than either the fecal or the total coliform methods. The Enterococci method measures the concentration of bacteria from a group of species within the *Streptococcus* genus, some of which (e.g., *Streptococcus faecalis*) are typically found in human and animal intestines (USEPA, 1985). Because some of the species that are detected by this method are not associated with fecal contamination (USEPA, 1985), this method can produce false-positive results, as can the total and fecal coliform methods. In addition, some bacterial pathogens and all viruses are not detected by this method.

In 1986, the USEPA (1986) recommended that Enterococci be used as an indicator of water quality at marine bathing beaches. This recommendation was based on studies by Cabelli (1983) at three locations (New York, NY; Boston, MA; and Lake Pontchartrain, LA). In these studies, Cabelli (1983) found that gastrointestinal symptoms reported by swimmers were strongly correlated with Enterococci levels, but not with levels of total or fecal coliforms. Additionally, in 1997 USEPA approved and adopted *Method 1600: Membrane Filter Test Method for Enterococci in Water* (USEPA, 1997). This method enabled faster turnaround time for testing of Enterococci as an indicator of water contamination, thereby making the method practical for local use. This is the method required by MDPH regulations for use in Massachusetts marine waters. In 2003, USEPA approved and adopted a number of new culture and enzyme-substrate methods (e.g., Enterolert and Colilert) for testing both Enterococci and *E. coli* in ambient water (Jagals et al., 2000; Federal Register, 2003). In some cases, these new methods can provide results in less time than the 24-48 hours currently required. The new methods are expected to come into widespread use over the next several years.

b) Total Coliform Method

The most general, but no longer recommended, testing method is the total coliform method. This method measures the number of bacteria in a water sample that will grow under certain laboratory conditions (Cabelli, 1983). A large number of different kinds of organisms are measured by this method, some of which are found exclusively in human and animal intestines (i.e., *Escherichia coli*) (Cabelli, 1983; USEPA, 1985). The

advantages of this testing method are that it can be performed quickly and it is relatively sensitive to the presence of fecal contamination given the large number of species that it can detect. However, this method can falsely predict the presence of fecal pathogens because some of the species that are detected by the method (e.g., some species in the genus *Aeromonas*) are not found exclusively in human and animal feces (NAS, 1977; Cabelli, 1983). Furthermore, some waterborne pathogens (e.g., *Salmonella typhi*) and all viruses (e.g., Hepatitis A) are not detected by this method (NAS, 1977).

c) Fecal Coliform Method

The fecal coliform test is similar to the total coliform test in that it measures the number of bacteria (including *Escherichia coli*) that can grow under certain laboratory conditions. However, the fecal coliform test only measures a subset of the species detected by the total coliform method. As a result, the fecal coliform test detects fewer organisms that are not associated with fecal contamination than the total coliform test, thereby reducing the chance of false-positive results. False positive results are still possible, however, because the fecal coliform method does detect some bacteria that have other sources besides human and animal feces (Cabelli, 1983). The fecal coliform method, like the total coliform method, can fail to detect waterborne pathogens in some cases because it does not detect all waterborne pathogens or viruses.

3. Historical and Current Water Quality Criteria - Marine

Water quality criteria are guidance concentrations that are used by public health officials to make decisions regarding the health risks associated with swimming. These criteria are typically expressed as the concentration of an indicator in the water above which there is an unacceptable risk for adverse health effects resulting from swimming. The concentration of a microorganism in water is usually reported as the number of colony forming units (CFU) of indicators per 100 milliliters (ml) of water. For any given measurement of the indicator species in water, the actual health risk from swimming in that water will depend on what pathogens are present in the water. Therefore, to make a decision as to the actual health risk posed by a particular beach, other factors in addition to water quality criteria for an indicator species are important to consider (e.g., recent rainfall patterns, the number of people who use the beach).

a) Enterococci

In 1986, USEPA published *Ambient Water Quality for Bacteria – 1986*. In this document, USEPA recommended Enterococci instead of fecal or total coliforms as the indicator of marine water quality and provided a scientific rationale for its use. Rapid laboratory methods became available in the late 1990's to allow for the adoption of this indicator. Enterococcus is currently the mandated indicator organism for routine monitoring of Massachusetts bathing beaches (105 CMR 445.000).

The recommended use of Enterococci was based on studies by Cabelli (1983) that tested many different indicator organisms at several beaches in the United States to see which indicator organism correlated best with the incidence of acute gastrointestinal disease among swimmers. These studies showed that the concentration of Enterococci in marine waters were more strongly correlated with the incidence of swimming-associated gastroenteritis than were the concentrations of other indicators, including total and fecal coliforms. From these data, a relationship between the number of cases of swimming-associated disease and the Enterococci concentration in the water was established. USEPA (1986) used this relationship to establish the criteria for Enterococci in marine waters at 104 CFU per 100 ml for a single sample and 35 CFU per 100 ml for the geometric mean of at least five samples over a 30-day period. These criteria were set such that the expected incidence of gastrointestinal illness among swimmers would be the same as it had been for the previous USEPA water quality criteria for fecal coliform (i.e., 19 illnesses per 1000 swimmers at marine beaches). MDPH**/**BEH adopted this standard by regulation beginning with the 2000 bathing season.

b) Fecal Coliform

In 1968, fecal coliform replaced total coliform as the recommended indicator species for marine water quality, however, as mentioned, fecal coliform is no longer recommended under state regulations. At that time, the National Technical Advisory Council of the Federal Water Pollution Control Administration established criteria for the geometric mean of the fecal coliform count over a 30-day period (for a minimum of five samples) at 200 CFU per 100 ml with no more than 10% of the samples exceeding 400 CFU per 100 ml. These values correlated with a level of risk of no more than 19 cases of acute gastrointestinal illness per 1,000 swimmers in marine waters. USEPA adopted this

standard in 1976. By 1978, the majority of states and territories had adopted this standard as well (Cabelli, 1983; USEPA, 1986).

c) Total Coliform

Formerly, the water quality criterion used by the MDPH/BEH was based on the use of total coliforms. Specifically, the total coliform concentration could not exceed 1,000 CFU per 100 ml. After its establishment, this criterion was adopted by the Joint Committee of the American Public Health Association, the State Sanitary Engineers, and many states (Cabelli, 1983).

4. Health Effects From Swimming in Freshwater

Several studies conducted by the USEPA and others (Dufour, 1984; USEPA, 1986; Cabelli, 1989; CDC, 1991-2004) have observed gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea, abdominal pain) as a result of swimming in fresh waters. The results of these studies have suggested that swimmers may be exposed to pathogens while swimming in fresh waters. Pathogens associated with human fecal matter may be present in fresh waters as a result of system failures in human sewage treatment facilities, or rainfall and resulting surface water runoff and other factors. Leachate from septic systems may be a potential source of microbiological contamination as well as animal wastes subject to runoff (e.g., wastes from dogs or farms). Swimmer-to-swimmer contamination is another potential source for microbiological contamination. Swimmers, bathers, waders, surfers, and others who come into full- or most-body contact with swimming water may all contribute to contamination (California, 1997; Gerba, 2000).

5. Beach Water Quality Testing Methods – Freshwater

As indicated in the regulation (105 CMR 445.031) (see Appendix A), the indicator organisms for freshwater bathing beaches are *E. coli* and Enterococcus based on research conducted by USEPA (Dufour, 1984; USEPA, 1986). The Enterococcus method has previously been discussed.

a) E. coli Method

Escherichia coli (*E. coli*) is a species of bacteria that is found exclusively in human and animal intestines (USEPA, 1985). Certain strains of this species are enteric (i.e., intestinal) pathogens (NAS, 1977). While both the total and fecal coliform methods can detect *E. coli* as part of a group of organisms, the *E. coli* method tests specifically for the presence or absence of this particular species. Because *E. coli* is exclusively found in human and animal intestines, this method is a very sensitive indicator of fecal contamination for freshwater beaches (USEPA, 1985).

6. Current Water Quality Criteria – Freshwater

As noted previously, for any given measurement of the indicator species in water, the actual health risk from swimming in that water will depend on what pathogens are present in the water. Therefore, to make a decision regarding the health risk related to a particular beach, other factors must be considered in addition to water quality criteria for indicator species, such as recent rainfall patterns and the number of people who use the beach.

a) E. coli

For freshwater, no single *E. coli* sample shall exceed 235 CFU per 100 ml and the geometric mean of the most recent five *E. coli* samples within the same bathing season shall not exceed 126 CFU per 100 ml. These are the criteria established in MDPH**/**BEH regulations (105 CMR 445.031).

b) Enterococci

For freshwater, no single Enterococci sample shall exceed 61 CFU per 100 ml and the geometric mean of the most recent five Enterococci samples within the same bathing season shall not exceed 33 CFU per 100 ml. These are the criteria established in the regulations (105 CMR 445.031).

Both *E. coli* and Enterococci standards are based on studies (Dufour, 1984; USEPA, 1986) that showed a strong correlation between levels of *E. coli* and Enterococci and rates of swimmer-associated gastrointestinal disease in freshwaters. The values are set

to a level of risk of no more than eight cases of acute gastrointestinal illness per 1,000 swimmers in freshwater beaches.

B. MDPH ACCOMPLISHMENTS - 2007

1. Beaches Website

In 2007, the electronic web-based system for public notification of marine beach postings and water quality monitoring data was updated to take into account additional sample locations and changes to beach names. Internal portions of the web's database were reviewed for accuracy and consistency. Minor corrections and updates were made in preparation for the beach season. Laboratories fulfilled their contract requirements by promptly entering sampling data and laboratory results into the MDPH/BEH public notification website as results became available. Beach postings were automatically generated by the website when submitted samples exceeded acceptable water quality standards. Display of these postings on the public pages occurs twice per day, at 9:30 AM and 12:30 PM. Local health officials were able to see the postings shortly before the public, allowing them to post beaches in a timely manner and prepare for public inquiries.

Local health officials of marine communities opting not to utilize MDPH/BEH contracted laboratories were provided with guidance and training, if necessary, to ensure quality assurance for data entry provided outside of the contract laboratory program. Two BOHs were provided limited access to the website for inputting their community's test results. Only one non-contract laboratory provided data entry for one community. For communities with extremely limited resources, MDPH/BEH ETP staff provided data entry assistance.

During the beach season, the website can be reached from MDPH/BEH's Beaches and Water page (http://www.mass.gov/dph/beaches) by clicking on "Beach Water Quality Locator" or directly at (http://mass.digitalhealthdepartment.com/public_21/index.cfm). Beach postings and current/historical data can be viewed by clicking on a series of maps to select an individual community (Figures 1 and 2). Once the community is selected, a listing of all marine beaches in that community is displayed along with the status of the beaches (Figure 3). The website automatically generates postings as samples are entered for those that exceed single-sample or geometric mean regulatory limits. The

data displayed on the website are updated as sample results are entered daily during the beach season.

All MDPH**/**BEH standardized forms related to beach monitoring are made available for download on the MDPH Beaches website via the Publications and Reports hyperlink. These include the Field Sampling Form, Postings Fax Form, Posting Sign Form and Tier III Sanitary Survey Form.

2. Public Health Emergency Response

Prior to the start of the 2007 beach season, and at the request of MDCR, MDPH/BEH developed a protocol for responding to harmful algae blooms at freshwater bodies. The algae protocol includes testing methodology, public notification guidelines, and algal concentration guidelines. The document benefited from the collaboration and input of MDCR and the Massachusetts Department of Environmental Protection (MDEP). The draft algae protocol was used in the Charles River Basin during the 2007 beach season, and was instrumental in helping to determine whether the 2007 Charles River Swim Event could occur.

During the 2007 season, MDPH/BEH also responded to several incidents that addressed potential impacts on bathing beaches. In addition to the Charles River, algae blooms were reported at Lake Lashaway in North Brookfield and East Brookfield, at Silver Lake in Wilmington, and at White Island Pond in Plymouth. MDPH/BEH ETP staff also participated in a town meeting in Goshen to give residents information on the causes of algae blooms and possible health effects relating to exposure. MDPH/BEH worked with all local health officials to ensure that the public was aware of potential health issues related to algae blooms. MDPH/BEH distributed fact sheets to local boards of health and conducted on-site assessments of the algae bloom where needed.

MDPH/BEH staff also provided assistance in investigating potential outbreaks of water-borne parasites and illnesses. An outbreak of *E. coli* O157:H7 among camp staff and campers occurred at Camp Hayward in Sandwich during the 2007 beach season. Camp Hayward is a recreational summer camp for girls and is operated by the South Shore YMCA. Camp Hayward is located on Spectacle Pond. The pond is extensively used for water-based recreation. Recreational use of the camp's beach was considered a

potential pathway for the infections. MDPH/BEH ETP Beaches staff conducted an on-site investigation in conjunction with staff from the MDPH/BEH Food Protection and Community Sanitation programs to investigate the source of the outbreak. As a result of the investigations, recreational use of the pond was determined to be an unlikely source of these infections.

MDPH/BEH ETP staff also provided technical assistance in response to a case of giardiasis in a camper at Hale Reservation, located in both Westwood and Dover, along with staff from MDPH/BEH Food Protection Program and Community Sanitation Program. Sampling results and case information were reviewed to determine if the beach located at Hale Reservation could be a potential exposure route. In conjunction with the Westwood Board of Health, and MDPH, Bureau of Communicable Disease Control (BCDC), Division of Epidemiology and Immunization, it was determined that the beach was unlikely to be the source for *Giardia* infection in this individual. The infected individual was excluded from water activities at the beach and information was distributed to the parents of other campers regarding the symptoms and prevention of *Giardia*.

Lastly, a *Vibrio vulnificus* infection was confirmed in a Cape Cod resident in August 2007. *Vibrio vulnificus* is a bacterium that is generally found in warmer coastal waters. When an individual with open wounds comes in direct contact with *Vibrio vulnificus* or when it is ingested it can cause serious infections, skin lesions, and fever and chills. To best address the range of possible causes and risks associated with *Vibrio vulnificus*, MDPH/BEH ETP Beaches staff worked with MDPH/BCDC Division of Epidemiology and Immunization, MDPH/BEH Food Protection Program, and the Massachusetts Division of Marine Fisheries to compose a fact sheet which was distributed to local boards of health on Cape Cod.

3. Training

In preparation for the 2007 beach season, MDPH/BEH ETP beaches staff conducted numerous outreach efforts to local boards of health to review the beaches regulations and their responsibilities under the regulations, as well as to provide them with any technical assistance or forms needed. MDPH/BEH ETP staff contacted all boards of health and discussed reporting deficiencies and updated MDPH/BEH's internal database

based on these conversations. These efforts likely enhanced reporting, as nearly all communities in the state reported beach testing results summarized in this report.

In addition, in preparation for the 2007 beach season, MDPH/BEH provided outreach to communities with Tier Three eligible beaches. (Note: Beaches are eligible for Tier Three status if, for at least the two years previous, they have complete weekly sampling data and have not had any exceedances.) Personal communication and mailings resulted in requests for MDPH/BEH to conduct sanitary surveys at 82 marine beaches. Based on sanitary surveys conducted by MDPH/BEH ETP staff, these marine beaches were granted sampling variances. MDPH/BEH staff also presented an in-depth review of the Tiered Monitoring Plan at the Cape and Islands Health Agents Coalition Meeting in April 2007. Topics discussed included: criteria for conducting a sanitary survey, definitions of Tier One, Two, and Three status, components of the MDPH/BEH downloadable sanitary survey form, and applying for a sampling variance at Tier Three eligible beaches. Tier Three beaches are sampled at least once every 30 days, with the sampling frequency determined by the local board of health.

4. Laboratory Programs

In 2007, MDPH/BEH again provided funding support to local marine communities for routine monitoring as required under Massachusetts regulations 105 CMR 445.000, Minimum Standards for Bathing Beaches, State Sanitary Code Chapter VII. Enlisting the services of contract laboratories provided this funding. The contracts are renewable on a yearly basis for a maximum of three additional years. These contracts were originally awarded in 2004 and were renewed with each of the laboratories for the 2007 beach season, which is the final yearly renewal. The laboratories were Barnstable County Department of Health and Environment Water Quality Testing Laboratory, Town of Chatham Department of Health and Environment Water Quality Laboratory, G & L Laboratories, Inc., and Wampanoag Environmental Laboratory. These laboratories analyzed 4,982 marine beach samples from 50 marine beach communities during the 2007 bathing beach season.

5. Sanitary Surveys

MDPH/BEH has previously announced to local health officials in all eligible marine communities the availability of technical assistance to help communities implement bathing beach sanitary surveys as part of MDPH/BEH's *Public Health-Based Beach Evaluation, Classification, and Tiered Monitoring Plan*. The goal of the Tiered Monitoring Plan is to ultimately direct water quality monitoring resources to beaches identified as those in greatest need of remediation of pollution problems. Those beaches that are more pristine based on sampling results and sanitary surveys can be monitored less often than the initially required weekly routine monitoring pursuant to both the Massachusetts and federal beach acts. This is accomplished in Massachusetts through the variance process.

The Plan includes an explanation of the three-tiered classification system for marine beaches (see www.mass.gov/dph for document). In this system every beach is classified as "Tier One", "Tier Two", or "Tier Three".

- Tier One – Heavily used beaches which have pollution problems. These beaches must be tested at least twice per week.
- Tier Two – Beaches with some pollution. These beaches must be tested once per week (the standard frequency).
- Tier Three – Beaches with no known pollution problems. These beaches are eligible for waivers upon completion of a sanitary survey and can then be tested less frequently (e.g., every two weeks to once per month).

Prior to the 2007 beach season, MDPH/BEH coordinated with local health officials to conduct sanitary surveys at public beaches in 19 marine communities that were eligible for Tier 3 status. Eligible beaches had not had any exceedances in the past two or more beach seasons, and had no known pollution problems. MDPH/BEH ETP staff conducted site visits to assess potential bacterial sources at the beach. They also met with town officials to determine if stormwater outfalls or septic systems were present near the beach. The sanitary surveys were reviewed by local officials, who in most cases granted a sampling variance.

6. Quality Assurance

As mentioned previously, MDPH/BEH completed a revised QAPP in May 2007 which was subsequently approved by USEPA and distributed to contracted laboratories before the 2007 beach season. The revision was made due to the changes that have occurred in the Beaches Project since the original QAPP was approved in 2003 (e.g., new approved methods, personnel changes, website completion). The QAPP describes the quality assurance, quality control, and related activities, including enforcement aspects, which are in place to ensure the results of the project will meet USEPA's published performance criteria. There are four main parts of the QAPP: project management, data generation and acquisition, assessment and oversight, and data validation and usability. The project management section describes the project's organization, planning, schedule, and performance criteria. The data generation and acquisition section discusses the sampling and analytical methods, chain-of-custody, and instrument/equipment quality control. The section on assessment and oversight outlines the audits and assessments that will be performed to ensure compliance with the QAPP and Standard Operating Procedure (SOP). The final section, data validation and usability, describes the process for reviewing, verifying, and validating data.

7. Flagship Beach Project

In 2007, MDPH/BEH completed and published the final sanitary survey reports for Willow's Pier Beach in Salem, Wollaston Beach in Quincy, and Ryder Street Beach in Provincetown. The Flagship Beach Reports detail specific activities undertaken at these beaches, including targeted monitoring for indicator bacteria and determining likely sources of bacteria from non-point and stormwater pollution sources and discharges of untreated sewage. These reports were distributed to the municipalities in an effort to assist with the identification of potential pollution sources and to recommend improvements that can reduce the number of closures at these highly visible and popular beaches.

8. Public Education

MDPH/BEH designed and distributed an educational brochure to inform the public of the risks to beach water quality due to the presence of pet waste at beaches. This informational brochure was designed to give beach users a background on the types of illnesses that can occur when pet waste is not properly disposed. It will also educate pet

owners on environmentally sound waste disposal practices to protect recreational waters in Massachusetts. This brochure was released in July 2007 and was distributed to local boards of health prior to the 2008 beach season. The brochure is also available for download via the MDPH/BEH Beaches Website.

III. METHODS

A. SAMPLE COLLECTION

State agencies that operate bathing beaches and local boards of health from the communities in Massachusetts that have public and semi-public bathing beaches are required to submit to MDPH/BEH beach field data and laboratory results for bathing beaches under their jurisdiction. The data collected by each community are recorded on a beach sampling field data collection form (Appendix E) developed by MDPH/BEH. For communities having public, marine beaches and using MDPH/BEH -contracted laboratories, these data were submitted electronically to MDPH/BEH via a secure Internet connection. Data were then displayed on the beaches website in near real-time for public notification of beach closures and test results. Several marine beach communities opted to use non-MDPH/BEH contracted laboratories in 2007. These communities were Ipswich, Kingston, Manchester-by-the-Sea, Mattapoisett, New Bedford, and Rockport. The Boards of Health or Health Departments of Ipswich, Kingston, Manchester-by-the-Sea, and Rockport either faxed the data to MDPH beach inspectors, who entered the data, or entered the data themselves directly onto the beaches website for prompt public notification. MDPH/BEH ETP staff provided training to local health officials on how to use the website for data reporting.

Sample collection was required to be in compliance with the *Standard Methods for the Examination of Water and Waste Water* of the American Public Health Association or as approved by the USEPA. The information collected included:

- Name of beach
- Community where beach is located
- Number of postings at each beach
- Beach designation (public, semi-public, or private)
- Sample identification number
- Date of sample collection
- Time of sample collection
- Weather condition at time of sample collection
- Air temperature
- Wind direction
- Time of last high tide (if applicable)

- Number of days from end of most recent rainfall to sample collection day
- Amount of most recent rainfall
- Sampling agency (e.g., local board of health, DCR, outside laboratory, other)
- Known pollution sources (e.g., boats, wildlife, septic systems, outflow pipes, streams)
- Beach type (marine or freshwater)
- Bather density (i.e., number of people in the water)
- Water temperature
- Water clarity
- Observations (e.g., trash, sludge deposits, oils, algae, fish die-off, jellyfish, birds)
- Indicator (Enterococci for marine, Enterococci or *E. coli* for freshwater; note, two freshwater beaches were still tested for the fecal coliform indicator, which is not in compliance with 105 CMR 445.031)
- Indicator level in colony forming units (CFU) of bacteria per 100 mL of water
- Exceedance (i.e., indicator levels greater than 104 CFU / 100 mL for Enterococci in marine waters, 61 CFU / 100 mL for Enterococci in fresh waters, or 235 CFU / 100 ml for *E. coli* in fresh waters)
- Comments

B. LABORATORY ANALYSIS

Laboratory analysis of samples was required to be in compliance with the *Standard Methods for the Examination of Water and Waste Water* of the American Public Health Association or as approved by the USEPA. Laboratories that were contracted by MDPH to perform public, marine beach sample analysis were further required to utilize the Modified Enterococci Method (Method 1600) or Enterolert as approved by the USEPA and the MDPH/BEH Beach Project QAPP. These laboratories were required to report exceedances of bacterial water quality standards to MDPH/BEH and local boards of health as soon as analyses were completed and results available.

C. DATA REPORTING

MDPH/BEH contracted laboratories electronically entered information from the field sampling forms and analytical results for marine beaches as soon as results were available for the majority of marine communities in Massachusetts. The electronic data were posted on the MDPH/BEH public notification website in order to provide public

notification of marine bathing beach water quality and beach closings in near real-time. Some local BOHs that did not utilize MDPH/BEH contract laboratories faxed their sampling results to MDPH/BEH ETP staff who entered the data onto the beaches website or had other laboratories input the data for them. Local health officials faxed bacterial exceedances and corresponding beach postings, as well as pre-emptive beach postings to MDPH/BEH within 24 hours of occurrence. In accordance with 105 CMR 445.000, freshwater sampling forms and analytical results were faxed or e-mailed to MDPH/BEH by local health officials. This information was due by October 31st. MDPH/BEH ETP staff entered all of these data into a database for inclusion in this annual report, as well as in support of USEPA reporting requirements under the 2007 BEACH Grant. The USEPA BEACH Grant mandates that MDPH must electronically report to USEPA all routine monitoring sampling data and laboratory results, as well as beach postings, on an annual basis.

D. DATA VALIDATION

All data were validated and checked for completeness by MDPH/BEH ETP personnel using faxed copies of field and laboratory reports sent by local boards of health. Local boards of health and laboratories were contacted directly, as necessary, to resolve questions and discrepancies in the reports.

E. PUBLIC NOTIFICATION

Under Massachusetts law (MGL C 111, § 5S), the local board of health is required to post signs at the entrance(s) to a beach immediately or within 24 hours of being notified that the beach did not meet water quality standards. In addition, the local board of health is required to notify MDPH/BEH that the beach has been posted and that standard signs have been put up at key access points to the beach within 24 hours. In 2003, using funding provided as part of the USEPA BEACH Grant, MDPH/BEH established a website for displaying sampling results and beach postings for all public, marine beaches in the state. Starting in 2004, MDPH/BEH -contracted laboratories have entered data from the field sampling forms and analytical results for marine beaches electronically as soon as results were available. In addition, notification that a public marine beach had been posted (i.e., signs put up) is entered electronically via the beaches website if there has been an exceedance of Enterococci. The analytical results and beach posting information were displayed on the public website in near real-time.

Verification of the posting was sent on a standard posting form by fax to MDPH/BEH by local health officials within 24 hours of occurrence.

F. LIMITATIONS

The ability of MDPH/BEH to provide prompt public notification of beach water quality monitoring results is limited by both the completeness and accuracy of the data reported; the use of indicator organism criteria that, although strongly supported in the recent literature, has some uncertainties; and analytical techniques that require 24 hours for results, thereby potentially leaving beach users at risk**.** The electronic reporting system and public beaches website has vastly improved the accuracy and quality of marine data submitted. In 2007, Massachusetts has once again achieved 100% compliance in the use of the state and federally mandated Enterococci indicator organism testing among public marine beaches reporting routine monitoring results. The use of proper and consistent sampling procedures is an important step in ensuring the quality of data reported. As a result of training, the use of standardized field sampling forms and the participation of contracted laboratories, consistency in the format and completeness of data reported continues to improve.

For the 2007 beach season, MDPH/BEH was successful in collecting data from 99% of the communities with open freshwater beaches. The amount and quality of data submitted from each community, however, varied greatly. During the beach season, each community utilizes different monitoring techniques. Therefore, the comprehensiveness of data varies among communities. Currently, with the exception of exceedances, which are required to be reported to the MDPH/BEH within 24 hours, freshwater beach data are normally reported once during the year, after the end of the beach season. As a result, MDPH/BEH ETP personnel can only review the data for proper sample collecting and testing techniques. MDPH/BEH continues to work individually with local boards of health to reduce issues related to quality control and variability by providing guidance and resources as necessary.

Another limitation, related to the specificity of analytical methods, is that the data are indicator-, not pathogen-, specific. As a result, the data only suggest a potential for the presence of pathogens that can cause human disease. The presence or absence of specific pathogens is not assayed. The use of indicators implies that water meeting the

criteria may harbor disease-causing microorganisms and also that water considered unsafe may not carry any disease-causing microorganisms (e.g., Polo et al., 1998; Moore et al., 2001; Prieto et al., 2001; Schindler, 2001). This is an inherent limitation of using indicators as a test of water quality, in Massachusetts and elsewhere. However, it does need to be emphasized that a substantial body of scientific research generally supports the use of these indicators as described earlier in this document (Cabelli, 1983; USEPA, 1986).

The criteria developed for each indicator are set at a specific level of risk of an adverse health effect, in this case gastrointestinal (GI) illness, not at a no-risk level. The indicator limits recommended by USEPA for Enterococci in marine waters are associated with a risk level of 19 GI illnesses / 1000 swimmers (USEPA, 1986). Therefore, levels of indicators considered in compliance by the Massachusetts and national requirements do not imply freedom from risk of adverse health effects for the total population at risk.

Using current indicators, it takes 24 hours to receive the results of a bathing beach water sample analysis (Wade et al., 2005). This delay can lead to the exposure of bathers to unsafe bacterial levels, as well as unnecessary closings (Wade et al., 2006) (e.g., beach closed on day of results, but by then the bacterial criteria may not be exceeded). This delay also makes it very difficult for investigators to track the source of contamination back to its origins, as it may dissipate before an investigation begins (Evaluation of New Methods, SCCWRP).

Development of a reliable rapid testing method continues. This new method would expedite obtaining results in the laboratory, in turn expediting the transmission of results to beach managers. Ideally, beach managers would be able to sample in the morning and receive results that same day, minimizing both exposures and unwarranted closures. A modified method of polymerase chain reaction (PCR), quantitative PCR (QPCR), detects in real time specific DNA sequences that originate from a particular organism, like fecal indicator bacteria such as Enterococcus (Haugland, 2005). QPCR can measure indicator bacteria levels in recreational water samples and give results in 2 hours or less (Wade et al., 2006). In freshwater studies, a significant correlation was shown between water quality as measured by QPCR and swimming-related gastroenteritis (Wade et al., 2005). Because the rapid indicator method has been shown to accurately predict health effects in much less time, its use may reduce instances of

illness and erroneous beach closings (Wade et al., 2006). More studies will need to be completed before QPCR can be considered to replace the current indicator methods. USEPA plans to conduct epidemiology studies using QPCR methods through 2009, after which new test methods will be developed, refined, validated, and published (USEPA, 2007).

Finally, acceptable levels of risk are typically determined by the incidence of GI symptoms among swimmers compared to that for non-swimmers. While research has shown that GI is the most sensitive outcome, it should be noted that pathogens found in marine and freshwater can cause other symptoms, including respiratory, dermatologic, ophthalmologic, and constitutional.

IV. RESULTS

During the 2007 bathing season, 219 of 227 communities in Massachusetts with public and semi-public marine or freshwater beaches sent water quality data to MDPH/BEH (Table 1). Of those eight communities that did not submit data, six closed their beaches for the duration of the 2007 beach season. Only two communities did not submit data for freshwater beaches that were open (North Adams and Lowell).

In total, MDPH received water quality data collected from 599 marine and 610 freshwater sampling locations at 521 marine and 549 freshwater beaches respectively. Due to the length of some beaches in Massachusetts, multiple sampling locations are necessary to distinguish specific areas of water quality. For the purposes of this report, a sample location is considered a single beach. In total, MDPH/BEH received 15,651 water samples from marine and freshwater beaches collected during the 2007 beach season. These data represent approximately 96 percent of the 227 Massachusetts communities that have marine and/or freshwater beaches. There are 33 communities that have only marine bathing beaches, 167 communities that have only freshwater beaches, and 27 that have both marine and freshwater bathing beaches within their limits (Table 2 and Figure 4).

Summaries and analyses of the marine and freshwater bathing beach data are presented in Tables 1 – 23 and Figures 1 – 22. The data are divided by type of beach (marine vs. freshwater) to allow easy comparison to earlier reports that analyzed marine

bathing beaches only (e.g., MDPH, 1997) and to accommodate the different testing criteria for the two types of beaches (see Background section). The data were analyzed according to type of beach, presence or absence of data, bather density, pollution source, bacterial indicator, frequency of testing, organization that performed testing, exceedances based on current Massachusetts criteria, and beach postings. Data are grouped according to either community, beach, or individual water sample in order to facilitate understanding and interpreting the results. For example, bather density at a given beach changes during the day and season, so it makes sense to express these data in terms of bather density at the time an individual water sample was taken. Alternatively, testing frequency only makes sense in terms of a given beach. The data are presented in tabular (Tables 1- 23), pie graph and chart (Figures 4 – 12, 15 - 18, 20, and 22), and map (Figures 13-14, 19, and 21) forms.

A. MARINE BEACHES

During the 2007 bathing season, all of the 60 Massachusetts coastal communities with known public or semi-public marine bathing beaches submitted beach monitoring data to MDPH/BEH (Tables 3 and 4, Figure 5). The 60 communities which have known public and semi-public marine bathing beaches accounted for 599 sampling locations at 521 public or semi-public marine bathing beaches.

A total of 7,674 water samples were collected from marine public and semi-public beaches and reported to MDPH/BEH during the 2007 bathing beach season (Table 4). Bather density data were collected as part of routine sampling during 2007. Massachusetts regulations require samples to be taken within the area of greatest bather density (105 CMR 445.000). GPS surveys of marine beaches completed by MDPH/BEH in 2003 and subsequent observations by MDPH/BEH beach inspectors confirm that samples are being taken within the areas that typically receive the highest use (greatest bather density) such as areas near main entrances and/or areas closest to parking lots. Given the time needed to collect and analyze samples, a majority of the samples were collected at times where bather density consisted of 10 individuals or less (Table 5 and Figure 6). Most samples are collected before noon when the bather load is generally low, even in high-use areas.

With the passage of the Massachusetts Beaches Act in 2000, the state adopted the USEPA recommended Enterococci as the standard indicator for water quality monitoring at marine beaches. Since the institution of the MDPH**/**BEH contract laboratories and website, Boards of Health in Massachusetts marine communities have all adopted the use of Enterococci as an indicator organism (Table 6). Enterococci were the indicator used for all water samples taken at marine beaches in 2007 (Figure 7). The use of MDPH/BEH contracted laboratories for analyzing public marine beach water samples has likely played a major role in achieving uniform compliance with the MDPH/BEH regulation for marine beaches.

Eighty-seven percent of the marine beaches were tested daily or weekly (in most cases, the minimum requirement is weekly sampling) (Table 7 and Figure 8). Most of the remaining marine beaches were beaches that were permitted to sample less frequently because of Tier Three status. However, there were four beaches (0.6%) that were not tested with the required frequency. Communities that did not test all their beaches with the required frequency have been contacted and reminded of the regulatory requirements related to frequency of testing. MDPH**/**BEH contract laboratories performed the majority of analyses at marine beaches during 2007, accounting for 58% of the samples reported (Table 8). Local health departments, independent laboratories, the National Park Service, and DCR performed the remainder of the marine beach water analyses.

The total number of marine beach postings (i.e., verification to MDPH**/**BEH that a sign was posted at the beach) decreased from 411 in 2006 to 228 in 2007 (Table 9). The number of postings in 2007 (228) totaled less than the total number of single sample exceedances (247). This could be due to a variety of reasons, such as a single beach posting covering several exceedances. These data are discussed further in the Discussion section. The percentage of exceedances versus total number of samples collected decreased in 2007 (3.2%) (Table 10), after remaining relatively consistent from 2005 (4.6%) to 2006 (4.8%). Of the 599 public or semi-public marine beach locations, 150 (25%) incurred at least one bacterial exceedance (Table 11).

Total rainfall amounts at many Massachusetts beaches during the 2007 season were much lower compared to 2006 (Tables 12 and 13). In 2007, the Boston area received less than half of the 2006 summer rainfall total, while the southeast region received less

than one-third of its 2006 summer rainfall total. Both June and August 2007 averages were generally consistent between the southeast region and Boston area, although Cape Cod experienced a slightly drier June and August than Greater Boston. In 2006, June was the wettest month in both Boston (10.09 inches) and Cape Cod (9.49 inches). These amounts for June 2007 dropped to 2.12 inches in Boston and 1.38 inches on Cape Cod. Only the month of July had similar amounts of rainfall on Cape Cod during 2007 when compared to the 2006 season.

As part of routine sampling, environmental observations are recorded on a field data form and reported to MDPH/BEH. In 2007, 12 percent (n=957) of the forms accompanying marine samples recorded a potential transient pollution source (Table 14). These are potential sources of contamination, such as birds, dogs, algae, trash, sludge deposits, waste solids, and oils. These sources are not always present at the beach and thus are recorded at the time of sampling. Of the 957 samples that had transient pollution sources noted, 51 (5.3%) of the associated bacterial samples exceeded the bacterial standard. In 2007, MDPH added "None" as an observation to the field form for the first time, which was noted for 1,649 samples. There were no observations recorded on the field data forms from 5,048 bacterial samples. There were 196 (2.9%)of these samples exceeded the bacterial standard.

In 2003, the MDPH/BEH GPS survey of marine beaches identified beach sampling locations that were near permanent sources of pollution, such as outfall pipes, that may pose a risk to human health on a more regular basis. Of the 247 marine beach samples that exceeded regulatory limits, 99 occurred at locations identified as near these pollution sources (Table 15). In 2007, sample sites having identified pollution sources nearby incurred bacterial exceedances in 4.8% of samples taken, whereas sampling locations with no known pollution sources nearby incurred exceedances in 2.6% of samples taken.

B. FRESHWATER BEACHES

During the 2007 bathing season, 182 of the 194 Massachusetts communities with known public or semi-public freshwater bathing beaches submitted beach monitoring data to MDPH/BEH (Tables 4, 16, 17 and Figure 9). Of the 12 communities that did not report freshwater data for 2007, ten (Brookfield, Dartmouth, Duxbury, Huntington, New

Bedford, New Marlborough, Norton, Shirley, Weymouth, and Worthington) did not open the freshwater beaches in their communities. Lowell and North Adams are the only communities that did not submit data for open freshwater beaches. The 182 communities contain 610 public or semi-public freshwater bathing beaches and collected a total of 7,977 freshwater samples that were reported to MDPH/BEH during the 2007 bathing beach season (Table 4).

In terms of bather density (Table 5 and Figure 10), the data look similar to that of marine beaches, with a high percentage (78%) indicating low bather density (0-10 bathers on the beach) during sampling. Approximately 52% of samples taken at freshwater beaches were obtained during non-peak bathing hours, either before 10:00 am or after 4:00 pm (Table 18). Samples at beaches are often taken in the morning to allow adequate time for delivery to and analysis at the laboratory.

In 2007, local boards of health used *E. coli* as an indicator organism for the majority of freshwater beaches (80%) in Massachusetts (Table 6). At the remaining beaches, 14% (85 beaches) used Enterococci, 1% (7 beaches) used both Enterococci and *E. coli*, and 4 % (22 beaches) used *E. coli* and total coliform. Less than 1 % used *E. coli* and fecal coliform (3 beaches), *E.coli*, Enterococci, and total coliform (1 beach), *E. coli*, Enterococci, total coliform, and fecal coliform (3 beaches), or fecal coliform (2 beaches) as their indicator organism (Figure 11).

Most of public and semi-public freshwater beaches in Massachusetts were tested with the minimum required weekly frequency in 2007, with more than 97% of the freshwater beaches tested at least weekly (Table 7 and Figure 12). Five freshwater beaches have Tier Three status and sample every other week, as approved by MDPH and the local board of health. Two percent of freshwater beaches (n = 12) either did not sample as required or submit data to MDPH/BEH detailing all sampling conducted for the season. As noted, communities that did not test all their beaches with the required frequency have been contacted to review regulatory requirements. Independent laboratories were responsible for a majority of samples analyzed from freshwater beaches, accounting for 64% of samples reported to MDPH/BEH (Table 8). Local health departments and DCR performed the remainder of analyses at freshwater beaches.

The number of exceedances of the freshwater water quality standards (235 cfu/100ml *E. coli* and 61 cfu/100ml Enterococci) decreased from 279 (3.8%) in 2006 to 236 (3.0%) in 2007 (Table 10). This decrease is noteworthy, as there was an increase in both the number of samples collected and the number of beaches tested. MDPH/BEH reviewed the environmental observations recorded during sample collection. Twelve percent (n=963) of the samples collected in 2007 recorded a transient pollution source (Table 14). Of the 963 samples that had transient pollution sources noted, 49 (5.1%) of the associated bacterial samples exceeded the bacterial standard. In 2007, MDPH added "None" as an observation to the field form for the first time, which was noted for 363 samples. There were no observations recorded on the field data forms from 6,651 bacterial samples. There were 187 (2.7%) of these samples that exceeded the bacterial standard. As with marine samples, it is not known whether the remaining 6,651 samples with no environmental observations recorded actually had no sources or whether the observer did not record sources.

V. DISCUSSION

A. ANALYSIS OF RESULTS

Since the passage of the Massachusetts Beaches Act in 2000, the state has adopted the USEPA recommended Enterococci as the standard indicator for water quality monitoring at marine beaches and Enterococci were the indicator used for all 7,674 water samples taken at marine beaches in 2007 (Table 6). The use of MDPH/BEH contracted laboratories for processing public marine beach water samples likely helped to facilitate uniform compliance with the MDPH/BEH regulation.

In 2007, MDPH/BEH continued to see improvements in the number of communities complying with bathing beach water quality reporting requirements. All marine communities and 99% of freshwater communities with open beaches reported bathing beach water quality data to MDPH/BEH (Figures 12 and 13), up from 98% of marine communities and 83% of freshwater communities reporting in 2001. A significant improvement, particularly for marine beaches, is the public notification figures and increased compliance in reporting to MDPH/BEH of any posting within 24 hours for 2007. In 2001, MDPH/BEH received postings for approximately 35% of all exceedances at marine bathing beaches and approximately 40% of all exceedances at freshwater beaches. In 2007, MDPH/BEH received postings for all but two instances when notification to MDPH/BEH was required (a total of 228 postings for marine waters). It should be noted that a posting may not always occur when there is an exceedance. For example, if a beach is already posted because of a prior single sample or geometric mean exceedance and a follow up sample shows a continued exceedance, an additional posting notification to MDPH/BEH is not required for the follow up exceedance result. Therefore a single beach posting could cover several exceedances. Additionally, a posting notification is not required if a second sample is taken within 24 hours of the original exceedance and those resample results do not exceed the standard. It should also be noted that local boards of health may preemptively post beaches without a test result showing bacterial exceedance and those instances are included in the total number of postings. The current rate of postings received versus exceedances has improved greatly over the past few years. At freshwater beaches posting notifications were not received by MDPH/BEH for 41 exceedances in 2007, which is improved over

previous years. As previously mentioned, postings do not necessarily always correlate with exceedances for various reasons.

Completeness of the field data form has also increased over the years. While there are still areas for improvement, such as actively reporting both the presence and absence of environmental sources, Massachusetts local health officials have for the most part adhered to MDPH/BEH's field forms. This can be seen in the wide range of potential sources of pollution now received by MDPH/BEH. Prior to 2003, most noted potential sources of pollution were fairly general (i.e., outflow pipes, wildlife, and boats). Starting in 2004 and continuing in the 2007 bathing beach season, more communities began to document incidents of algae and wrack build-up on beaches and the presence of trash, birds, dogs, waste solids and fish die-offs. These notations become an important factor when the communities or MDPH/BEH need to identify possible reasons for continuously elevated bacterial levels at a particular beach that may increase potential health risks and to develop strategies to reduce these sources.

During the 2007 beach season, the rate of marine beach exceedances was lower compared to most previous years with data. As shown in Table 10, between 2001 and 2007, 4.3% of all samples collected during the time period exceeded the Enterococcus standard. The highest percentage of exceedances in any given year occurred in 2001 (6.2%), while the lowest occurred in 2002 (2.8%). Between 2003 and 2006, the percentages slightly rose each year from 4.2% in 2003 to 4.8% in 2006. In 2007, the percent exceedances dropped to 3.2%, indicating improved beach water quality (Figure 18). This may be related to reduced rainfall in 2007 compared to most previous years (see Tables 12 and 13). All marine communities that had at least one exceedance in 2007 appear in Figure 19. The quality of reporting has also improved due to the electronic reporting requirement associated with MDPH/BEH contract laboratories. In 2007, MDPH/BEH received the required posting notification for all but two marine exceedances. As noted previously, an exceedance may not result in a new posting if the beach was already posted due to a previous exceedance or due to a precautionary posting. A complete listing of all marine beaches sampled during the 2007 beach season, their exceedances and postings can be found in Table 19.

Overall 3.0% of the samples collected at freshwater beaches had an exceedance during 2007 (Table 10 and Figure 20). This was the lowest average percent of exceedances

observed since the Beaches Act took effect in 2001. It is also less than the average percentage of exceedances between 2001 and 2007 (4.2%). All freshwater communities that experienced at least one exceedance in 2007 can be seen in Figure 21. An analysis of the exceedance and posting data for 2007 showed that there were 41 exceedances for which MDPH/BEH should have received a posting notification, but did not. It is unclear if these exceedances resulted in beach postings and notification was not submitted or if there was a failure to post as a result of an exceedance. While compliance is improving, these results highlight the need for continued outreach to health departments of freshwater communities on beach water quality regulatory requirements. Efforts were made by MDPH**/**BEH ETP staff to obtain posting information by directly contacting communities both during and after the beach season to explain the regulations and to provide standardized reporting forms, as well as making both the forms and regulations available for download from the MDPH/BEH website. MDPH/BEH will target local health officials in communities with freshwater beaches to provide technical assistance and improve compliance with the posting requirements before the 2008 beach season.

Observations made by samplers at marine beaches may help to explain some contributing factors to elevated indicator levels (Table 14). Of the 957 samples collected from marine beaches that had a potential transient pollution source noted, 5.2% exceeded the Enterococci regulatory limit. The remaining marine beach samples that did not indicate an environmental source exceeded the regulatory limit 2.9% of the time. This may mean that the potential sources of pollution observed (e.g., algae, birds, trash) are in fact contributors to elevated bacteria levels. Environmental observations made at freshwater beaches also seemed to contribute to the percentage of exceedances (5.1% for those with a recorded pollution source versus 2.7% for those with no recorded source). However, it should be noted that overall only 33% of marine samples and 17% of freshwater samples collected were accompanied by a field data form that recorded either a potential transient pollution source or “None". Again, it should be noted that it is unknown whether field data forms with blank observation fields indicate there were no sources actually present versus the observer failed to record whether a source was present.

Table 21 and Figure 22 illustrate how the total number of exceedances statewide is significantly higher within 24 hours of a rain event. 72% of marine beach exceedances

and nearly 58% of freshwater exceedances occurred within 24 hours of a rain event. This figure shows the exponential drop-off in the number of exceedances as the time from rainfall increases.

In 2007, the amount of rainfall was greater in the Boston area versus the southeast region. In August, very little rain fell across the state (less than one half inch). More moderate amounts of rain fell in June and July. Compared to 2006, each summer month in 2007 received less rainfall, except for July in the Boston area. For additional detail on rainfall amounts, see Tables 12 and 13, which show rainfall totals and deviation from the norm for the months of June, July and August, from 2001 through 2007. Stormwater runoff associated with wet weather has been shown to be a significant source of sewage contamination at bathing beaches (Cabelli et al, 1982; Cabelli, 1989; Pruss, 1998; Gerba, 2000; Schindler, 2001). Sources of runoff to surface waters include direct runoff from paved surfaces such as roads and boat ramps, runoff channeled through drainpipes, natural and man-made swales, and increased flow of freshwater streams. These sources can carry bacteria present over a wide area directly to a beach. Runoff is positively related to land use density (houses per unit area) of the area drained (MDEP and MCZM, 1997). Therefore, it is likely to have more exceedances at beaches in urban areas (i.e. Boston Harbor) than beaches in rural areas (i.e. Nantucket). Many Massachusetts communities have addressed combined sewer overflows and stormwater runoff problems in response to USEPA's stormwater regulations. Water quality improvements are expected to continue into the future with the assistance of better monitoring and reporting as well as new infrastructure projects.

Another potential influence on bacteria levels in bathing waters may be spring tides. These strong tides, which take place year-round, occur when the earth, sun, and moon are in line and the gravitational forces of both the moon and sun contribute to the larger than normal tides. Spring tides occur during full and new moons, and recent attention has been focused on them with respect to water quality and beaches. In a study released by the Southern California Coastal Water Research Project, a government agency that focuses on marine environmental research, researchers found beaches to be twice as likely out of compliance with water quality standards during spring tides. This study concluded bacteria levels may be higher during spring-ebb tides (receding tides) compared to all other tidal conditions and that Enterococci densities were found at beaches during tidal events with no obvious point source. The study suggested that

tidally forced sources of Enterococci may be occurring at beaches (Gorss 2005). Potential sources for these Enterococci could include beach sands and sediments, decaying plant material, and polluted groundwater. All of these sources are known to harbor fecal indicator bacteria and have the potential to become 'activated' with the mass and momentum of a spring tide (i.e., disturbing bacteria that would have otherwise lain dormant).

The bather load at a particular beach has the ability to affect water quality because humans are also sources of fecal pollution. The greater the bather density at a beach, the greater the likelihood that human sources are contributing to higher Enterococci levels. However, as in previous years, more than three quarters of the marine beach samples (86%) and freshwater beach samples (78%) that reported bather density indicated low bather density (0-10 bathers on the beach) during sampling. This can be attributed largely to samples being taken during off-peak hours for swimming. More than 59% of samples taken at marine beaches were obtained either before 10:00 AM or after 4:00 PM (Table 18). Approximately 10% of the samples were collected between 12:00 PM and 4:00 PM. Samples are primarily collected before 12:00 PM so that laboratories can begin the analysis before the close of business and before the six hour holding time expires. Thus, it is difficult to comprehensively evaluate the effect of bather density on beach water quality.

For the most part beaches that had a high number of exceedances in 2006 had fewer exceedances in 2007. It is likely that the reduced amount of rainfall during the 2007 beach season compared to the 2006 beach season had a significant affect on the reduced numbers of exceedances at these beaches. Tables 22 and 23 compare the beach water monitoring data at marine and freshwater beaches that had the highest percentage of exceedances during the 2006 season and the corresponding data in 2007. Table 22 shows that most of these marine beaches had a similar or lower percentage of exceedances in 2007. As in previous years, the Chatham Board of Health decided to preemptively close Cockle Cove Creek beach because of consistently elevated indicator levels and the sampling history of the beach. Table 23 displays the 2006 and 2007 data for freshwater beaches. Similar to the marine beach results, most of the freshwater beaches had a similar or smaller percentage of exceedances. Also, the Lynn Board of Health decided to preemptively close Flax and Sluice Ponds due to

consistently elevated indicator levels based on the sampling history of the beaches, as they have done in the past.

B. FUTURE PLANS

Direct Web-Based Reporting

In 2008, MDPH/BEH contracted laboratories, local boards of health and others will continue to perform data entry to the electronic, web-based public notification website. MDPH/BEH will be working with contract laboratories and other data reporters to ensure field data are accurately recorded via the web-based reporting system. Important information regarding recent rainfall data and the presence of transient pollution sources will be targeted. As in previous years, a history of postings will be maintained on the website to facilitate analysis of the data for future annual reports. This will provide more accurate recordkeeping so that trends can be analyzed in future annual reports.

Training and Community Outreach

MDPH/BEH plans to continue its support of communities' bathing water monitoring efforts by continuing to offer training sessions on current regulations, sampling techniques and the use of standardized reporting forms. MDPH/BEH will also continue its training and outreach efforts to provide technical assistance to freshwater communities. In the spring of 2008, MDPH/BEH will pair with the MDPH Community Sanitation Program and the Massachusetts Health Officers Association to provide four separate training events for local boards of health in four different regions of the state. These trainings will include a discussion on MDPH/BEH's proposed updates to the Bathing Beach Regulations and information on harmful algae blooms. MDPH/BEH will also provide assistance on the use of the MPDH posting form and the field data forms that are required to be completed each time a sample is taken.

MDPH/BEH will also continue to distribute educational/informational materials (e.g., the brochure on pet waste) in order to educate the public on beach water quality and the hazards of not properly disposing of pet waste and its effects on water quality at a beach.

Beaches Inventory

In 2008, MDPH/BEH plans to complete a comprehensive inventory of public freshwater beaches in Massachusetts. The inventorying of the beaches will consist of visiting the site, obtaining GPS coordinates, collecting data on facilities (such as bathrooms), and photographing the beach area. Eventually, a GIS datalayer will be created from all the GPS points that will be similar to the public marine beach datalayer that MDPH/BEH has already created.

Beach Regulations

MDPH/BEH is proposing amendments to the Massachusetts beach regulations to provide more information to beachgoers and help local health officials with enforcement of the current testing and posting requirements. These amendments will also clarify language currently in the regulations and ensure notification is received by local boards of health and MDPH/BEH in case of bacterial exceedances. The proposed amendments to the regulations are planned to be in place before the start of the 2009 beach season.

Laboratory Programs

In 2008, MDPH/BEH will enlist the services of contract laboratories to provide local support for sampling requirements under the regulations. MDPH/BEH will post a new Request For Responses on the Comm-PASS professional services open solicitation website. New contracts for laboratories will be in place before the start of the 2008 beach season. MDPH/BEH will evaluate these proposals based on the laboratory's abilities, services provided, and value. The contracts awarded will be able to be renewed on a yearly basis for a maximum of four additional years. The laboratories contracted through this system will analyze routine monitoring samples at marine beaches in local communities and provide the resulting data within a specified time period to both the local boards of health and to the general public through the Beach Water Quality Locator website.

Sanitary Surveys

MDPH/BEH will continue to facilitate sanitary surveys in support of the Tiered Monitoring Plan and the variance process during 2008. When the Tiered Monitoring Plan is adopted at specific beaches, a “high” priority beach will receive the most frequent water quality sampling and analysis. Such a beach might be one with high bather volume, high frequency or percentage of exceedances, problematic sources of pollution, or a combination of these factors. A “medium” priority beach will be sampled once per week and will still be required to meet water quality standards. Beaches that are tiered “medium” can have any of the factors listed for “high” priority beaches but with less frequency or intensity of any of the three criteria. A “low” priority beach is one that is relatively pristine. Low priority beaches are eligible for less frequent testing, as infrequently as every 30 days under 105 CMR 445.000, if the local health department receives a testing variance. This categorization will assist MDPH/BEH in working with local health departments in 2008 to conduct sanitary surveys that will support the Tiered Monitoring Plan. Data from the 2006 and 2007 beach seasons will be incorporated into the existing Tiered Monitoring Plan to update the published classifications. These efforts will allow MDPH/BEH and marine communities to focus on determining and alleviating pollution sources at problematic beaches, and also allowing MDPH/BEH to reduce unnecessary sampling at low priority beaches through the variance process. MDPH/BEH will be conducting many sanitary surveys at public marine beaches in support of these efforts.

VI. SUMMARY

This report summarizes beach monitoring and testing data from Massachusetts public and semi-public marine and freshwater bathing beaches in the 2007 season. In total, 217 of the 219 communities with operating bathing beaches reported 15,651 water samples collected at 1,209 beaches. In 2007, the state of beaches in Massachusetts continued to show improvements in terms of the number of beaches reporting data and the number of samples taken. The beach testing results from the 2007 season show improving water quality compared to prior years’ results at both marine and freshwater beaches, with the percentage of exceedances lower than the 2006 beach season’s averages and historical averages. Massachusetts marine communities are nearly in full compliance with the regulations with the exception of some semi-public beaches missing

several sampling rounds and posting notifications. This illustrates in part the success of the electronic reporting requirement through the MDPH/BEH contract laboratory system for marine beaches. This requirement has also facilitated improved compliance with the regulations by BOHs in other areas besides sample reporting. For example, 100% of the marine beach samples were tested for the correct regulatory indicator. MDPH/BEH also achieved nearly full compliance with the posting regulation in marine communities and improved the number of postings received from freshwater communities. Freshwater bathing beach monitoring data showed greater consistency in 2007. Ninety-nine percent of the beaches tested used the correct regulatory indicators for freshwater, and the percentage of postings versus exceedances received by MDPH/BEH was slightly higher in 2007 versus 2006.

MDPH/BEH continues to provide training and information to local communities in an effort to improve compliance with the regulations. MDPH/BEH also continues to make improvements to its public notification website to make sure this information is accessible to the public as soon as it becomes available. In addition, MDPH/BEH is continuing to focus efforts on the most vulnerable beaches through its Tiered Monitoring Plan and sanitary surveys.

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IX. TABLES

Table 1

All Massachusetts communities grouped according to the presence or absence of data for marine or freshwater public and semi-public bathing beaches in 2007.

Type of community	#	%
Marine or freshwater beach, with data	219	62.4%
Marine or freshwater beach, without data	8	2.3%
No beaches	124	35.3%
Total	351	100%

Table 2

All Massachusetts communities grouped by the presence and/or absence of marine and freshwater public and semi-public bathing beaches in 2007.

Type of community	Number (#)	Percentage (%)
Marine beach only	33	9.4%
Freshwater beach only	167	47.6%
Marine and freshwater beaches	27	7.7%
No beaches	124	35.3%
Total	351	100%

Table 3

Water quality testing at marine public and semi-public bathing beaches in Massachusetts, grouped by community, for the years 2007, 2006, 2005, 2004, 2003, 2002, 2001, 1996, and 1995.

Coastal communities									
Type of community	**2007**	**2006**	**2005**	**2004**	**2003[a]**	**2002**	**2001[a]**	**1996**	**1995**
Coastal communities with marine bathing beaches	60	60	60	60	60	59	59	60	60
Coastal communities with marine bathing beaches for which data were obtained	60	60	60	60	60	59	58	53	52
Coastal communities with marine bathing beaches for which no data were obtained	0	0	0	0	0	0	1	7	8
Coastal communities without marine bathing beaches	10	10	10	10	10	11	11	10	10
Total number of coastal communities	70	70	70	70	70	70	70	70	70

a - The number of communities with marine beaches was adjusted as the inventory became more complete over time.

Table 4

Water quality testing at marine and freshwater public and semi-public bathing beaches in Massachusetts in 2007, grouped by community, beach, and sample.

Type of community	# communities (total)	# communities with data	# beaches[1] tested	# samples
Communities with marine bathing beaches	60	60	599	7,674
Communities with freshwater bathing beaches	194	182	610	7,977
		Total	1,209	15,651

1. Note this table does not include number of beaches not tested, as data was not compiled to accurately determine this number.

Table 5

Bather density at marine and freshwater public and semi-public bathing beaches in Massachusetts in 2007, at times when samples were taken.

Marine beaches		
Bather Density (# people)	**# Samples**	**%**
0-10	6,587	85.8%
10-20	193	2.5%
20-50	88	1.1%
>50	69	0.9%
Not indicated	737	9.6%
Total	7,674	100.0%
Freshwater beaches		
Bather Density (# people)	**# Samples**	**%**
0-10	6,221	78.0%
10-20	220	2.8%
20-50	172	2.2%
>50	95	1.2%
Not indicated	1,269	15.9%
Total	7,977	100.0%

Table 6

Water quality bacterial indicators or combinations of indicators used to test public and semi-public bathing beaches in Massachusetts in 2007, grouped by beach.

Marine Beaches		
Indicator(s)	**# Beaches**	**%**
Enterococcus only	598	100%
E. coli only	0	0%
Fecal coliform only	0	0%
Total coliform only	0	0%
Enterococcus and *E. coli*	0	0%
Enterococcus and fecal coliform	0	0%
Enterococcus and total coliform	0	0%
Enterococcus, fecal coliform, and total coliform	0	0%
Not monitored	1	0%
Total	599	100%
Freshwater Beaches		
Enterococcus only	85	14%
E. coli only	485	80%
Fecal coliform only	2	0%
Total coliform only	0	0%
Enterococcus and *E. coli*	7	1%
E. coli and fecal coliform	3	0%
E. coli and total coliform	22	4%
E. coli, Enterococcus, and total coliform	1	0%
E. coli , Enterococcus, fecal coliform, and total coliform	3	0%
Not monitored	2	0%
Total	610	100%

1. Each of the rows in this table is independent of the others (e.g., the number of beaches tested for Enterococcus and *E. coli* together is not included in the number of beaches tested for Enterococcus only).

2. Beaches that use multiple indicators usually do not use them on a consistent basis (e.g., water samples on a given date are tested with one indicator, while those tested on a different date are tested with another indicator).

Table 7

Frequency of water quality testing at public and semi-public bathing beaches in Massachusetts in 2007, grouped by beach and frequency.

Marine Beaches		
Test frequency	**# Beaches**	**%**
Daily	13	2.2%
Weekly	508	84.8%
Monthly	66	11.0%
Biweekly	10	1.7%
Two times	1	0.2%
One time	0	0.0%
Not monitored	1	0.2%
Total	599	100.0%
Freshwater Beaches		
Weekly	588	96.4%
Monthly	0	0.0%
Biweekly	10	1.6%
Twice per week	5	0.8%
Three times	2	0.3%
Two times	2	0.3%
One time	1	0.2%
Not monitored	2	0.3%
Total	610	100.0%

Table 8

Groups, agencies, or individuals who analyzed water samples collected at public and semi-public bathing beaches in Massachusetts in 2007.

Marine Beaches		
Testing organization	**# Samples**	**%**
Local Health Department	1,020	13.3%
Department of Conservation/ Division of Urban Parks and Recreation (DCR-DUPR)	1,280	16.7%
Department of Conservation/Division of State Parks and Recreation (DCR-DSPR)	109	1.4%
DPH Contract lab	4,417	57.6%
Outside lab	692	9.0%
Other	156	2.0%
Total	7,674	100.0%
Freshwater Beaches		
Local Health Department	1,948	24.4%
Department of Conservation/ Division of Urban Parks and Recreation (DCR-DUPR))	65	0.8%
Department of Conservation/Division of State Parks and Recreation (DCR-DSPR)	837	10.5%
Outside lab	5,062	63.5%
Other	65	0.8%
Total	7,977	100.0%

Table 9

The number of exceedances and postings at marine and freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Marine beaches	
Exceedances, Total (Enterococcus)	247
Postings, Total[1]	228
Postings, Enterococcus	195
Postings, Geomean	6
Postings, Preemptive Rainfall	23
Postings, Preemptive - Other	4
Freshwater beaches	
Exceedances, Total	236
Exceedances, Enterococcus	95
Exceedances, E. Coli	141
Postings, Total[1]	151
Postings, Enterococcus	70
Postings, E. Coli	65
Postings, Preemptive	6
Postings, Algae	3
Postings, Geomean	7

1. Total postings does not necessarily equal total exceedances because some tests that resulted in exceedances may have occurred while the beach was closed, or beach closings covered multiple parts of a beach that were counted as separate beaches in this report.

Table 10

The number of samples in which the measured Enterococcus concentration (marine beaches) or Enterococcus or *E. coli* concentration (freshwater beaches) exceeded their respective water quality criteria at public and semi-public bathing beaches in Massachusetts.

	Marine Beaches			Freshwater Beaches		
Year	Exceedances[1]	Total Samples	%	Exceedances[1]	Total Samples	%
2001	444	7200	6.2%	336	5651	5.9%
2002	185	6686	2.8%	264	6473	4.1%
2003	311	7451	4.2%	333	6480	5.1%
2004	336	7868	4.3%	267	7313	3.7%
2005	369	8073	4.6%	286	7148	4.0%
2006	404	8361	4.8%	279	7438	3.8%
2007	247	7674	3.2%	236	7977	3.0%
Average	328	7616	4.3%	286	6926	4.2%

1. For marine beaches, Enterococcus is the indicator species. A sample is said to be in exceedance if the number of colony forming units (CFU) / 100 ml is greater than 104 for a single sample or greater than 35 for the average of 5 samples over a 40-day period. For freshwater beaches, either Enterococcus or *E. coli* can be used as indicator species. For Enterococcus, a sample is said to be in exceedance if the number of CFU / 100 ml is greater than 61 for a single sample or greater than 33 for the average of at least 5 samples over a 40-day period. For *E. coli*, a sample is said to be in exceedance if the number of CFU / 100 ml is greater than 235 for a single sample or greater than 126 for the average of at least 5 samples over a 40-day period.

Table 11

The number of beaches in which at least one measured Enterococcus concentration (marine beaches) or at least one Enterococcus or E. coli concentration (freshwater beaches) exceeded their respective water quality criteria at public bathing beaches in Massachusetts in 2007.

	# beaches with at least one exceedance	Total # beaches reporting	%
Marine beaches	150	599	25.0%
Freshwater beaches	126	610	20.7%

Table 12

Beach season (June – August) rainfall data for Boston, 2001-2007*

Year	Boston				
	Rainfall	June	July	August	Total
2001	Total	4.99	2.13	4.14	11.26
	Dev From Norm	1.77	-0.93	0.77	1.61
2002	Total	4.78	1.42	2.13	8.33
	Dev From Norm	1.56	-1.64	-1.24	-1.32
2003	Total	4.69	2.11	2.89	9.69
	Dev From Norm	1.47	-0.95	-0.48	0.04
2004	Total	1.95	3.87	4.38	10.20
	Dev From Norm	-1.27	0.81	1.01	0.55
2005	Total	1.46	3.37	2.88	7.71
	Dev From Norm	-1.76	0.31	-0.49	-1.94
2006	Total	10.09	3.58	3.20	16.87
	Dev From Norm	6.87	0.52	-0.17	7.22
2007	Total	2.12	5.26	0.66	8.04
	Dev From Norm	-1.10	2.20	-2.71	-1.61

Table 13

Beach season (June – August) rainfall data for Chatham, 2001-2007*

Year	Chatham				
	Rainfall	June	July	August	Total
2001	Total	3.00	3.35	5.36	11.71
	Dev From Norm	-0.44	-0.03	2.03	1.56
2002	Total	2.88	0.48	2.45	5.81
	Dev From Norm	-0.56	-2.90	-0.88	-4.34
2003	Total	5.07	1.78	3.46	10.31
	Dev From Norm	1.63	-1.60	0.13	0.16
2004	Total	1.60	2.48	5.49	9.57
	Dev From Norm	-1.84	-0.90	2.16	-0.58
2005	Total	1.61	3.37	2.99	7.97
	Dev From Norm	-1.83	-0.01	-0.34	-2.18
2006	Total	9.49	2.97	2.61	15.07
	Dev From Norm	6.05	-0.41	-0.72	4.92
2007	Total	1.38	2.80	0.35	4.53
	Dev From Norm	-2.06	-0.58	-2.98	-5.62

* obtained from the National Weather Service Forecast office, at http://www.erh.noaa.gov/er/box/dailystns.shtml

Table 14

Number of exceedances for public and semi-public beaches which reported environmental sources of pollution in Massachusetts in 2007

Marine beaches			
	# of Exceedances	**# of Samples**	**%**
Recorded environmental pollution source	51	957	5.3%
No recorded pollution source	196	6,717	2.9%
Exceedance	247	7,674	3.2%
Freshwater beaches			
Recorded environmental pollution source	49	963	5.1%
No recorded pollution source	187	7,014	2.7%
Exceedance	236	7,977	3.0%

Table 15

2007 Marine Beach samples, exceedances and proximity to known pollution sources when a pollution source was specified

Sample Sites	2007 Samples	2007 Exceedances	% Exceedance
Near Pollution Sources	2,070	99	4.8%
No Known Pollution Source	5,604	148	2.6%
Total	7,674	247	3.2%

Table 16

Water quality testing at freshwater public and semi-public bathing beaches in Massachusetts, grouped by community, for the years 2007, 2006, 2005, 2004, 2003, 2002, 2001, 1996, and 1995.

All cities/towns							
Type of community	**2007[a]**	**2006[a]**	**2005[a]**	**2004[a]**	**2003[a]**	**2002[a]**	**2001[a]**
	#	#	#	#	#	#	#
Communities with freshwater bathing beaches	194	191	189	193	197	194	175
Communities with freshwater bathing beaches for which data were obtained	182	183	183	188	157	158	145
Communities with freshwater bathing beaches for which no data were obtained	12	8	6	5	40	36	30
Communities without freshwater bathing beaches	157	160	162	158	154	157	176
Total number of communities	351	351	351	351	351	351	351

a - The number of communities with beaches was adjusted as the inventory became more complete over time.

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Abington				X	X	
Acton				X	X	
Acushnet						
Adams						
Agawam				X	X	
Alford						
Amesbury				X	X	
Amherst						
Andover				X	X	
Aquinnah	X	X				
Arlington				X	X	X
Ashburnham				X	X	
Ashby				X	X	
Ashfield				X	X	
Ashland				X	X	X
Athol				X	X	
Attleboro						
Auburn				X	X	
Avon						
Ayer				X	X	
Barnstable	X	X		X	X	
Barre						
Becket				X	X	X
Bedford				X	X	
Belchertown				X	X	
Bellingham				X	X	X
Belmont						
Berkley						

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Berlin						
Bernardston						
Beverly	X	X				
Billerica				X	X	
Blackstone						
Blandford						
Bolton				X	X	
Boston	X	X				
Bourne	X	X		X	X	
Boxborough						
Boxford				X	X	
Boylston						
Braintree	X	X		X	X	
Brewster	X	X		X	X	
Bridgewater						
Brimfield				X	X	
Brockton						
Brookfield[1]				X		
Brookline						
Buckland						
Burlington						
Cambridge						
Canton						
Carlisle						
Carver				X	X	
Charlemont				X	X	
Charlton				X	X	X
Chatham	X	X		X	X	X

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Chelmsford				X	X	
Chelsea						
Cheshire						
Chester						
Chesterfield				X	X	
Chicopee				X	X	
Chilmark	X	X				
Clarksburg				X	X	
Clinton						
Cohasset	X	X				
Colrain						
Concord				X	X	X
Conway				X	X	X
Cummington				X	X	
Dalton						
Danvers	X	X				
Dartmouth[1]	X	X		X		
Dedham						
Deerfield						
Dennis	X	X		X	X	
Dighton						
Douglas				X	X	
Dover				X	X	
Dracut				X	X	
Dudley				X	X	
Dunstable						
Duxbury[1]	X	X		X		

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
East Bridgewater						
East Brookfield				X	X	
East Longmeadow						
Eastham	X	X		X	X	
Easthampton						
Easton				X	X	
Edgartown	X	X				
Egremont				X	X	
Erving				X	X	
Essex	X	X		X	X	
Everett						
Fairhaven	X	X				
Fall River						
Falmouth	X	X		X	X	
Fitchburg						
Florida				X	X	
Foxborough						
Framingham				X	X	
Franklin				X	X	
Freetown				X	X	
Gardner				X	X	X
Georgetown				X	X	
Gill						
Gloucester	X	X				
Goshen				X	X	
Gosnold						

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Grafton				X	X	
Granby						
Granville						
Great Barrington				X	X	
Greenfield				X	X	
Groton				X	X	
Groveland						
Hadley						
Halifax				X	X	
Hamilton						
Hampden						
Hancock						
Hanover						
Hanson				X	X	X
Hardwick						
Harvard				X	X	
Harwich	X	X		X	X	
Hatfield						
Haverhill				X	X	
Hawley						
Heath				X	X	
Hingham	X	X				
Hinsdale				X	X	
Holbrook						
Holden				X	X	
Holland				X	X	
Holliston				X	X	
Holyoke						

Table 17

Communities in Massachusetts, indicating type of beach
and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Hopedale						
Hopkinton				X	X	
Hubbardston				X	X	
Hudson				X	X	X
Hull	X	X				
Huntington[1]				X		
Ipswich	X	X		X	X	
Kingston	X	X		X	X	
Lakeville				X	X	
Lancaster				X	X	
Lanesborough				X	X	
Lawrence						
Lee				X	X	X
Leicester						
Lenox				X	X	
Leominster				X	X	X
Leverett						
Lexington				X	X	
Leyden						
Lincoln						
Littleton				X	X	
Longmeadow						
Lowell				X		X
Ludlow				X	X	
Lunenburg				X	X	X
Lynn[1]	X	X		X	X	
Lynnfield						
Malden						

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Manchester-by-the-Sea	X	X				
Mansfield						
Marblehead	X	X				
Marion	X	X				
Marlborough				X	X	X
Marshfield	X	X				
Mashpee	X	X		X	X	
Mattapoisett	X	X	X			
Maynard						
Medfield				X	X	X
Medford				X	X	
Medway[1]				X	X	
Melrose						
Mendon				X	X	X
Merrimac				X	X	X
Methuen				X	X	
Middleborough				X	X	
Middlefield						
Middleton				X	X	
Milford						
Millbury						
Millis						
Millville						
Milton				X	X	
Monroe						
Monson						
Montague						

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Monterey				X	X	
Montgomery						
Mount Washington				X	X	
Nahant	X	X				
Nantucket	X	X		X	X	
Natick				X	X	
Needham						
New Ashford						
New Bedford[1]	X	X		X		
New Braintree				X	X	X
New Marlborough[1]				X		
New Salem						
Newbury	X	X				
Newburyport	X	X				
Newton				X	X	
Norfolk						
North Adams				X		X
North Andover				X	X	
North Attleborough				X	X	
North Brookfield				X	X	
North Reading						
Northampton				X	X	X
Northborough						
Northbridge				X	X	
Northfield						

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Norton[1]				X		
Norwell						
Norwood						
Oak Bluffs	X	X				
Oakham				X	X	X
Orange				X	X	X
Orleans	X	X		X	X	
Otis				X	X	
Oxford				X	X	X
Palmer						
Paxton						
Peabody						
Pelham						
Pembroke				X	X	
Pepperell						
Peru				X	X	
Petersham						
Phillipston				X	X	X
Pittsfield				X	X	
Plainfield				X	X	X
Plainville						
Plymouth	X	X	X	X	X	X
Plympton						
Princeton						
Provincetown	X	X				
Quincy	X	X				
Randolph				X	X	X
Raynham						

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Reading						
Rehoboth						
Revere	X	X				
Richmond				X	X	
Rochester				X	X	
Rockland				X	X	
Rockport	X	X				
Rowe				X	X	
Rowley						
Royalston				X	X	X
Russell				X	X	
Rutland				X	X	
Salem	X	X	X			
Salisbury	X	X				
Sandisfield				X	X	
Sandwich	X	X		X	X	X
Saugus				X	X	
Savoy				X	X	
Scituate	X	X				
Seekonk						
Sharon				X	X	X
Sheffield				X	X	
Shelburne						
Sherborn				X	X	
Shirley[1]				X		
Shrewsbury				X	X	
Shutesbury				X	X	
Somerset	X	X				

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Somerville						
South Hadley						
Southampton						
Southborough						
Southbridge						
Southwick				X	X	
Spencer				X	X	
Springfield				X	X	
Sterling				X	X	X
Stockbridge				X	X	X
Stoneham						
Stoughton				X	X	
Stow				X	X	
Sturbridge				X	X	X
Sudbury						
Sunderland						
Sutton				X	X	
Swampscott	X	X				
Swansea	X	X	X			
Taunton				X	X	
Templeton				X	X	X
Tewksbury						
Tisbury	X	X				
Tolland				X	X	X
Topsfield				X	X	X
Townsend				X	X	
Truro	X	X				
Tyngsborough				X	X	

Table 17

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Tyringham				X	X	
Upton				X	X	
Uxbridge				X	X	X
Wakefield						
Wales				X	X	X
Walpole				X	X	X
Waltham						
Ware						
Wareham	X	X		X	X	
Warren				X	X	
Warwick						
Washington						
Watertown						
Wayland				X	X	
Webster				X	X	X
Wellesley				X	X	
Wellfleet	X	X		X	X	
Wendell				X	X	
Wenham				X	X	X
West Boylston						
West Bridgewater						
West Brookfield				X	X	
West Newbury						
West Springfield						
West Stockbridge				X	X	
West Tisbury	X	X		X	X	

Table 17

Communities in Massachusetts, indicating type of beach
and the presence or absence of data in 2007.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Complete Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Complete Data
Westborough				X	X	
Westfield				X	X	
Westford				X	X	
Westhampton						
Westminster				X	X	
Weston				X	X	
Westport	X	X		X	X	
Westwood				X	X	
Weymouth[1]	X	X		X		
Whately						
Whitman						
Wilbraham				X	X	X
Williamsburg						
Williamstown				X	X	X
Wilmington				X	X	
Winchendon				X	X	
Winchester				X	X	
Windsor				X	X	
Winthrop	X	X				
Woburn						
Worcester				X	X	
Worthington				X		X
Wrentham				X	X	X
Yarmouth	X	X		X	X	

1 - These communities did not open their freshwater beaches during the 2007 beach season.

Table 18

Time of day when samples were collected at public and semi-public bathing beaches in Massachusetts in 2007

	Marine		Fresh	
Time of Sample	**# Samples**	**% Samples**	**# Samples**	**% Samples**
Before 10:00 AM	4,548	59.3%	4,088	51.2%
Between 10:00 AM and 12:00 PM	2,278	29.7%	2,301	28.8%
Between 12:00 PM and 4:00 PM	797	10.4%	1,241	15.6%
After 4:00 PM	29	0.4%	57	0.7%
Indeterminate	22	0.3%	290	3.6%
Total	7,674	100.0%	7,977	100.0%

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Aquinnah	Lobsterville	Monthly	Enterococci	3				
Aquinnah	Moshup Beach	Weekly	Enterococci	10				
Aquinnah	Philbin Beach	Weekly	Enterococci	12				
Aquinnah	Red Beach	Monthly	Enterococci	3				
Barnstable	Bone Hill	Weekly	Enterococci	14				
Barnstable	Bridge Street	Weekly	Enterococci	13				
Barnstable	Cordwood Road	Weekly	Enterococci	13				
Barnstable	Cotuit Bay Shores Association	Weekly	Enterococci	12				
Barnstable	Covell's	Weekly	Enterococci	15	1	252	252	1
Barnstable	Craigville	Weekly	Enterococci	14				
Barnstable	Craigville Beach Club	Weekly	Enterococci	12	1	400	400	
Barnstable	Crocker's Neck	Weekly	Enterococci	14	1	248	248	1
Barnstable	Cross Street	Weekly	Enterococci	13				
Barnstable	Dowses	Weekly	Enterococci	14				
Barnstable	East (Town) Beach	Weekly	Enterococci	13	1	400	400	
Barnstable	Estey Avenue	Weekly	Enterococci	13				
Barnstable	Fifth Ave (boat launch)	Weekly	Enterococci	15	2	168	334	2
Barnstable	Indian Trail	Weekly	Enterococci	14				
Barnstable	Kalmus Ocean	Weekly	Enterococci	14				
Barnstable	Kalmus Yacht	Weekly	Enterococci	14				
Barnstable	Kennedy Memorial	Weekly	Enterococci	14	1	400	400	
Barnstable	Keyes Beach	Weekly	Enterococci	17	3	124	380	2
Barnstable	Little River Road	Weekly	Enterococci	13				
Barnstable	Loops	Weekly	Enterococci	14	1	134	134	1
Barnstable	Millway	Weekly	Enterococci	15	1	400	400	1
Barnstable	Oregon	Weekly	Enterococci	14	1	238	238	
Barnstable	Oyster Harbors Club	Weekly	Enterococci	12				
Barnstable	Oyster Place	Weekly	Enterococci	13				
Barnstable	Ropes	Weekly	Enterococci	13				
Barnstable	Sandy Neck	Weekly	Enterococci	15				
Barnstable	Scudder Lane	Weekly	Enterococci	12				
Barnstable	Seaside Park Improvement Association	Weekly	Enterococci	12				
Barnstable	Veterans	Weekly	Enterococci	15	1	400	400	
Barnstable	Wianno Avenue	Weekly	Enterococci	13				
Barnstable	Wianno Club (Salt-107 Seaview)	Weekly	Enterococci	12				
Beverly	Brackenbury	Weekly	Enterococci	12	2	200	3400	1

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Beverly	Dane Street	Weekly	Enterococci	12	1	3900	3900	1
Beverly	Goat Hill	Weekly	Enterococci	13	2	1100	2500	3
Beverly	Independence Park	Weekly	Enterococci	11				
Beverly	Lynch Park	Weekly	Enterococci	12	1	1200	1200	1
Beverly	Mingo	Weekly	Enterococci	9	1	1900	1900	1
Beverly	Obear Park	Weekly	Enterococci	11				
Beverly	Rice	Weekly	Enterococci	9	1	3000	3000	1
Beverly	Sandy Point	Weekly	Enterococci	12	1	1600	1600	1
Beverly	West	Weekly	Enterococci	11				
Beverly	Woodbury	Weekly	Enterococci	12	1	5300	5300	1
Boston	Camp Harbor View	Daily	Enterococci	38	2	200	390	2
Boston	Carson Beach (DCR - DUPR)	Daily	Enterococci	83	3	262	703	7
Boston	Carson Beach (DCR - DUPR)	Daily	Enterococci	83	5	118	3400	7
Boston	City Point Beach @ Farragut Road & Day Blvd. (DCR)	Daily	Enterococci	82	2	113	158	4
Boston	Constitution (DCR - DUPR)	Daily	Enterococci	82	2	496	1190	2
Boston	Constitution (DCR - DUPR)	Daily	Enterococci	82	2	521	570	2
Boston	Constitution (DCR - DUPR)	Daily	Enterococci	82	1	350	350	2
Boston	Lovell's Island (DCR - DUPR)	Weekly	Enterococci	11				
Boston	M Street Beach @ M Street (DCR - DUPR)	Daily	Enterococci	80	1	187	187	2
Boston	Malibu (DCR - DUPR)	Weekly	Enterococci	15				
Boston	Pleasure Bay @ Broadway (DCR - DUPR)	Weekly	Enterococci	15				
Boston	Savin Hill (DCR - DUPR)	Weekly	Enterococci	15				
Boston	Spectacle Island	Weekly	Enterococci	12	1	116	116	1
Boston	Tenean (DCR - DUPR)	Daily	Enterococci	81	8	105	435	10
Bourne	Barlows Landing	Weekly	Enterococci	13				
Bourne	Briarwood Marine and Science	Weekly	Enterococci	10				
Bourne	Cataumet Harbor	Weekly	Enterococci	13				
Bourne	Cedar Point Association	Weekly	Enterococci	12				
Bourne	Electric Avenue	Weekly	Enterococci	13				
Bourne	Gray Gables	Weekly	Enterococci	13				
Bourne	Hideaway Village Association	Weekly	Enterococci	12				
Bourne	Monument	Weekly	Enterococci	13				
Bourne	Patiusset Beach	Weekly	Enterococci	17	4	142	190	4
Bourne	Pocasset Beach Improvement Association	Weekly	Enterococci	12				
Bourne	Sagamore	Weekly	Enterococci	14	1	150	150	1
Bourne	Scraggy Neck Recreation Association	Weekly	Enterococci	12				

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Bourne	Tahanto Associates, Inc.	Weekly	Enterococci	12				
Bourne	Wings Neck Trust Association (North Beach)	Weekly	Enterococci	12				
Bourne	Wings Neck Trust Association (South Beach)	Weekly	Enterococci	12				
Braintree	Smith Beach	Weekly	Enterococci	13	1	149	149	1
Brewster	Breakwater Landing	Weekly	Enterococci	14	1	400	400	1
Brewster	Cape Cod Sea Camps (Bay)	Weekly	Enterococci	12				
Brewster	Crosby Landing	Weekly	Enterococci	13				
Brewster	Ellis Landing	Weekly	Enterococci	9				
Brewster	Linnell Landing	Monthly	Enterococci	4				
Brewster	Ocean Edge	Weekly	Enterococci	4				
Brewster	Ocean Edge	Weekly	Enterococci	4				
Brewster	Paines Creek	Weekly	Enterococci	13				
Brewster	Point of Rocks	Weekly	Enterococci	8				
Brewster	Robbins Hill	Weekly	Enterococci	12				
Brewster	Saints Landing	Weekly	Enterococci	13				
Brewster	Sea Pines	Weekly	Enterococci	4				
Brewster	Sunset	Weekly	Enterococci	4				
Chatham	Andrew Harding Lane Beach	Weekly	Enterococci	13				
Chatham	Bucks Creek	Weekly	Enterococci	16	1	416	416	1
Chatham	Chatham Bars Inn	Weekly	Enterococci	8				
Chatham	Cockle Cove	Weekly	Enterococci	14				
Chatham	Cockle Cove Creek	Weekly	Enterococci	14	4	216	1346	1
Chatham	Cockle Cove Creek	Weekly	Enterococci	16	2	124	792	1
Chatham	Forest Street Beach	Weekly	Enterococci	14				
Chatham	Hardings	Weekly	Enterococci	14				
Chatham	Hardings	Weekly	Enterococci	14				
Chatham	Hawthorne	Weekly	Enterococci	8				
Chatham	Jacknife Harbor	Weekly	Enterococci	13				
Chatham	Lighthouse	Weekly	Enterococci	14				
Chatham	Oyster Pond	Weekly	Enterococci	14				
Chatham	Pleasant Street	Weekly	Enterococci	14				
Chatham	Ridgevale	Weekly	Enterococci	14				
Chatham	Scatteree Town Landing	Weekly	Enterococci	13				
Chilmark	Great Rock Bight	Monthly	Enterococci	3				
Chilmark	Menemsha	Monthly	Enterococci	3				
Chilmark	Ocean @ Chilmark Pond Preserve	Weekly	Enterococci	12	1	132	132	1

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Chilmark	Ocean @ Lucy Vincent Beach	Monthly	Enterococci	3				
Chilmark	Ocean @ Squibnocket Beach	Weekly	Enterococci	11				
Chilmark	Pond @ Lucy Vincent Beach	Weekly	Enterococci	12				
Cohasset	Bassing's (Sailing Club)	Weekly	Enterococci	13				
Cohasset	Black Rock	Weekly	Enterococci	15	3	116	236	2
Cohasset	Little Harbor	Weekly	Enterococci	12				
Cohasset	Sandy	Weekly	Enterococci	13				
Cohasset	Sandy Cove	Weekly	Enterococci	12				
Cohasset	Yacht Club	Weekly	Enterococci	13				
Danvers	Sandy Beach	Weekly	Enterococci	14	4	144	24000	4
Dartmouth	Anthony's	Weekly	Enterococci	12				
Dartmouth	Apponagansett Town Beach	Weekly	Enterococci	12				
Dartmouth	Bayview	Weekly	Enterococci	12				
Dartmouth	Demarest Lloyd (DCR - DSPR)	Weekly	Enterococci	14				
Dartmouth	Hidden Bay	Weekly	Enterococci	10				
Dartmouth	Jones Town Beach	Weekly	Enterococci	12				
Dartmouth	Moses Smith Creek	Weekly	Enterococci	12	2	115	340	2
Dartmouth	Nonquitt	Weekly	Enterococci	12				
Dartmouth	Oak Hill Shores	Weekly	Enterococci	12				
Dartmouth	Round Hill	Biweekly	Enterococci	6				
Dartmouth	Salter's Point East	Weekly	Enterococci	12				
Dartmouth	Salter's Point South	Weekly	Enterococci	12				
Dennis	Bayview	Weekly	Enterococci	13				
Dennis	Chapin Memorial	Weekly	Enterococci	15	1	130	130	1
Dennis	Cold Storage	Weekly	Enterococci	13				1
Dennis	Corporation	Weekly	Enterococci	15	1	238	238	1
Dennis	Follins Pond	Weekly	Enterococci	13				
Dennis	Glendon Road	Weekly	Enterococci	13				
Dennis	Haigis	Weekly	Enterococci	14	1	130	130	1
Dennis	Harborview	Weekly	Enterococci	13				
Dennis	Howes Street	Weekly	Enterococci	13				
Dennis	Inman Road	Weekly	Enterococci	14	1	132	132	1
Dennis	Mayflower	Weekly	Enterococci	14				
Dennis	Raycroft	Weekly	Enterococci	13				
Dennis	Sea Street (Dennisport)	Weekly	Enterococci	13				
Dennis	Sea Street (East Dennis)	Weekly	Enterococci	13				

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Dennis	South Village	Weekly	Enterococci	14	1	122	122	1
Dennis	Sullivan (Depot St.)	Weekly	Enterococci	15	2	126	260	2
Dennis	Trotting Park	Weekly	Enterococci	13				
Dennis	West Dennis	Weekly	Enterococci	12				
Dennis	West Dennis	Weekly	Enterococci	13				
Dennis	West Dennis	Weekly	Enterococci	13				
Duxbury	Duxbury Beach @ Bath House	Weekly	Enterococci	14				
Duxbury	Landing Road	Weekly	Enterococci	14				
Duxbury	Residents Beach (Duxbury Beach)	Weekly	Enterococci	14				
Duxbury	Shipyard Lane	Weekly	Enterococci	14				
Duxbury	West End	Weekly	Enterococci	14				
Eastham	Boat Meadow	Weekly	Enterococci	14				
Eastham	Campground	Weekly	Enterococci	14				
Eastham	Coast Guard	Weekly	Enterococci	12				
Eastham	Coast Guard	Weekly	Enterococci	12				
Eastham	Cole Road	Weekly	Enterococci	14				
Eastham	Cook's Brook	Weekly	Enterococci	14				
Eastham	Dyer Prince	Weekly	Enterococci	15	1	400	400	1
Eastham	First Encounter	Weekly	Enterococci	14				
Eastham	First Encounter	Weekly	Enterococci	13				
Eastham	Kingsbury	Weekly	Enterococci	13				
Eastham	Nauset Light	Weekly	Enterococci	12				
Eastham	Nauset Light	Weekly	Enterococci	12				
Eastham	Nauset Light	Weekly	Enterococci	12				
Eastham	S. Sunken Meadow	Weekly	Enterococci	13				
Eastham	Silver Springs Association	Weekly	Enterococci	12				
Eastham	Thumpertown	Weekly	Enterococci	13				
Eastham	Town Cove	Weekly	Enterococci	13				
Edgartown	Bend in the Road	Monthly	Enterococci	7				
Edgartown	Chappy Beach Club	Weekly	Enterococci	9				
Edgartown	Chappy Point Beach	Monthly	Enterococci	3				
Edgartown	East Beach (Chappy)	Monthly	Enterococci	4				
Edgartown	Fuller Street	Weekly	Enterococci	11				
Edgartown	Joseph Sylvia State Beach	Weekly	Enterococci	10				
Edgartown	Joseph Sylvia State Beach	Weekly	Enterococci	3				
Edgartown	Norton Point Beach	Monthly	Enterococci	3				

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Edgartown	Ocean @ Edgartown Great Pond	Monthly	Enterococci	3				
Edgartown	South Beach State Park	Weekly	Enterococci	3				
Edgartown	South Beach State Park	Weekly	Enterococci	10				
Edgartown	South Beach State Park	Weekly	Enterococci	3				
Edgartown	Wasque Swim Beach	Weekly	Enterococci	6				
Essex	Clammer's Beach	Weekly	Enterococci	14				
Essex	Front Beach	Monthly	Enterococci	4				
Fairhaven	Fort Phoenix (DCR - DSPR)	Weekly	Enterococci	18	4	154	472	2
Fairhaven	Manhattan Avenue	Weekly	Enterococci	12				
Fairhaven	Raymond Street	Weekly	Enterococci	12				
Fairhaven	Seaview	Weekly	Enterococci	13	1	1700	1700	1
Fairhaven	West Island Causeway	Monthly	Enterococci	3				
Fairhaven	West Island Town Beach	Monthly	Enterococci	3				
Falmouth	Acapesket Improvement Association	Weekly	Enterococci	12				
Falmouth	Bikepath Beach (Trunk River)	Weekly	Enterococci	13				
Falmouth	Bristol	Weekly	Enterococci	13				
Falmouth	Bristol	Weekly	Enterococci	13				
Falmouth	Chapoquoit	Weekly	Enterococci	14				
Falmouth	Chapoquoit Associates - Front Beach	Weekly	Enterococci	12				
Falmouth	Chapoquoit Associates - Little Beach	Weekly	Enterococci	12				
Falmouth	Falmouth Associates - 564 Surf Drive	Weekly	Enterococci	12				
Falmouth	Falmouth Heights	Weekly	Enterococci	13				
Falmouth	Falmouth Heights	Weekly	Enterococci	13				
Falmouth	Falmouth Yacht Club	Weekly	Enterococci	12				
Falmouth	Jetty Lane	Weekly	Enterococci	12				
Falmouth	Little Island Beach Preserve	Weekly	Enterococci	9				
Falmouth	Megansett	Weekly	Enterococci	14				
Falmouth	Menauhant	Weekly	Enterococci	13				
Falmouth	Menauhant	Weekly	Enterococci	13				
Falmouth	Mill Road	Weekly	Enterococci	13				
Falmouth	New Silver (Silver Beach Improvement Association)	Weekly	Enterococci	10				
Falmouth	Nobska Beach Association	Weekly	Enterococci	12				
Falmouth	Old Silver 1	Weekly	Enterococci	13				
Falmouth	Old Silver 2	Weekly	Enterococci	13	1	190	190	1
Falmouth	Old Silver 2	Weekly	Enterococci	12				
Falmouth	Old Silver Beach Estates Assoc.	Weekly	Enterococci	12				

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Falmouth	Racing Beach Association	Weekly	Enterococci	12				
Falmouth	Saconessett Hills Association	Weekly	Enterococci	13	1	328	328	1
Falmouth	Seacoast Shores Associates, Inc.	Weekly	Enterococci	13	1	114	114	1
Falmouth	Shorewood Beach Association	Weekly	Enterococci	21	10	106	400	4
Falmouth	Sippewissett Highlands Trust	Weekly	Enterococci	12				
Falmouth	Stoney Beach (MBL)	Weekly	Enterococci	13				
Falmouth	Surf Drive	Weekly	Enterococci	13				
Falmouth	Surf Drive	Weekly	Enterococci	12				
Falmouth	Surf Drive	Weekly	Enterococci	13				
Falmouth	Wild Harbour Estates	Weekly	Enterococci	12				
Falmouth	Wood Neck Beach	Weekly	Enterococci	15	1	166	166	1
Falmouth	Wood Neck River	Weekly	Enterococci	15	2	160	400	2
Gloucester	Cressy's	Weekly	Enterococci	12				
Gloucester	Good Harbor	Weekly	Enterococci	14				
Gloucester	Good Harbor Creek	Weekly	Enterococci	12				
Gloucester	Half Moon	Weekly	Enterococci	14				
Gloucester	Niles	Weekly	Enterococci	12				
Gloucester	Pavillion Beach	Weekly	Enterococci	12				
Gloucester	Plum Cove	Weekly	Enterococci	12				
Gloucester	Wingearsheek	Weekly	Enterococci	14				
Harwich	Allen Harbor	Weekly	Enterococci	11	1	400	400	1
Harwich	Atlantic Avenue	Monthly	Enterococci	4				
Harwich	Bank Street - Bayview Rd	Monthly	Enterococci	4				
Harwich	Brooks	Monthly	Enterococci	4				
Harwich	Earle Road	Monthly	Enterococci	3				
Harwich	Grey Neck	Monthly	Enterococci	4				
Harwich	Merkel Beach (Snow Inn Road)	Monthly	Enterococci	4				
Harwich	Neel Road	Monthly	Enterococci	4				
Harwich	Old Mill Point Association	Weekly	Enterococci	12				
Harwich	Old Mill Point Association	Weekly	Enterococci	12				
Harwich	Pleasant Bay	Monthly	Enterococci	4				
Harwich	Pleasant Road	Monthly	Enterococci	4				
Harwich	Red River	Weekly	Enterococci	4				
Harwich	Red River	Weekly	Enterococci	3				
Harwich	Red River	Weekly	Enterococci	13				
Harwich	Seabreeze	Monthly	Enterococci	4				

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Harwich	The Belmont	Weekly	Enterococci	12				
Harwich	Wah Wah Taysee Road	Monthly	Enterococci	4				
Harwich	Wequasett Inn Resort	Weekly	Enterococci	13	1	110	110	1
Harwich	Zylpha	Weekly	Enterococci	13				
Hingham	Belair	Weekly	Enterococci	11				
Hingham	Kimball	Weekly	Enterococci	11				
Hingham	North	Weekly	Enterococci	11				
Hingham	Otis	Weekly	Enterococci	11				
Hingham	Seal Cove	Weekly	Enterococci	11				
Hingham	Town Beach	Weekly	Enterococci	11				
Hingham	Wampatuck	Weekly	Enterococci	11				
Hingham	Yacht Club	Weekly	Enterococci	11				
Hull	A Street Bay Side	Weekly	Enterococci	12				
Hull	A Street Ocean	Weekly	Enterococci	12				
Hull	Darcy's	Weekly	Enterococci	12				
Hull	Edgewater	Weekly	Enterococci	12				
Hull	Gunrock	Weekly	Enterococci	12				
Hull	Hampton Circle	Weekly	Enterococci	8				
Hull	Helen Street	Weekly	Enterococci	11				
Hull	James Ave.	Weekly	Enterococci	13	1	112	112	1
Hull	Kenburma	Weekly	Enterococci	12				
Hull	Nantasket (DCR - DUPR)	Weekly	Enterococci	15				
Hull	Nantasket (DCR - DUPR)	Weekly	Enterococci	15				
Hull	Nantasket (DCR - DUPR)	Weekly	Enterococci	15				
Hull	Nantasket (DCR - DUPR)	Weekly	Enterococci	15				
Hull	Newport	Weekly	Enterococci	12				
Hull	XYZ	Weekly	Enterococci	12				
Ipswich	Clark	Weekly	Enterococci	16				
Ipswich	Crane	Monthly	Enterococci	5				
Ipswich	Little Neck	Weekly	Enterococci	17	1	240	240	1
Ipswich	Pavillion	Monthly	Enterococci	5				
Ipswich	Steep Hill	Weekly	Enterococci	17	1	142	142	1
Kingston	Gray's	Weekly	Enterococci	15				
Kingston	Rocky Nook	Weekly	Enterococci	15				
Lynn	Kings (DCR - DUPR)	Weekly	Enterococci	16	1	135	135	2
Lynn	Kings (DCR - DUPR)	Weekly	Enterococci	15	1	173	173	2

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Manchester	Black	Weekly	Enterococci	16	2	134	350	2
Manchester	Magnolia	Weekly	Enterococci	14				
Manchester	Magnolia	Weekly	Enterococci	15				
Manchester	Singing	Weekly	Enterococci	15				
Manchester	Singing	Weekly	Enterococci	15				
Manchester	Tuck's Point	Weekly	Enterococci	17	2	160	1200	2
Manchester	West Manchester	Weekly	Enterococci	17	3	120	2500	4
Manchester	White	Weekly	Enterococci	16	1	450	450	1
Marblehead	Crocker Park	Weekly	Enterococci	10				
Marblehead	Devereux	Weekly	Enterococci	12				
Marblehead	Gas House	Weekly	Enterococci	13	1	273	273	1
Marblehead	Grace Oliver	Weekly	Enterococci	13	1	128	128	1
Marblehead	Stramski	Weekly	Enterococci	12				
Marblehead	Sunset Road	Weekly	Enterococci	12				
Marblehead	Village Street	Weekly	Enterococci	12				
Marion	Beverly Yacht	Weekly	Enterococci	12	1	500	500	1
Marion	Converse Point	Weekly	Enterococci	11				
Marion	Dexter Lane	Weekly	Enterococci	11				
Marion	Island Wharf	Weekly	Enterococci	11				
Marion	Oakdale Avenue	Weekly	Enterococci	11	1	246	246	1
Marion	Piney Point	Weekly	Enterococci	11				
Marion	Planting Island	Weekly	Enterococci	11				
Marion	Silver Shell	Weekly	Enterococci	11				
Marion	Silver Shell	Weekly	Enterococci	11				
Marion	Tabor Academy	Weekly	Enterococci	11				
Marion	Tabor Academy	Weekly	Enterococci	11				
Marshfield	Brant Rock	Weekly	Enterococci	12				
Marshfield	Fieldston	Weekly	Enterococci	12				
Marshfield	Fieldston	Weekly	Enterococci	12				
Marshfield	Green Harbor	Weekly	Enterococci	12				
Marshfield	Rexhame	Weekly	Enterococci	15				
Mashpee	Callies Beach	Monthly	Enterococci	4				
Mashpee	Mashpee Neck Road (Town Landing)	Weekly	Enterococci	13				
Mashpee	Maushup Village	Weekly	Enterococci	12				
Mashpee	New Seabury Inn	Weekly	Enterococci	10				
Mashpee	Popponesset	Weekly	Enterococci	12				

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Mashpee	Popponesset Spit	Weekly	Enterococci	13	1	166	166	1
Mashpee	Seconsett Island Causeway	Weekly	Enterococci	13				
Mashpee	South Cape Beach (DCR - DSPR)	Weekly	Enterococci	16	1	200	200	1
Mashpee	South Cape Civic Association	Weekly	Enterococci	10				
Mattapoisett	Antasawomak	Weekly	Enterococci	10				
Mattapoisett	Antasawomak	Weekly	Enterococci	10	1	248	248	1
Mattapoisett	Aucoot	Weekly	Enterococci	12	2	112	384	
Mattapoisett	Brant Beach	Weekly	Enterococci	10				
Mattapoisett	Crescent	Weekly	Enterococci	10				
Mattapoisett	Harbor 1	Weekly	Enterococci	10				
Mattapoisett	Harbor 2	Weekly	Enterococci	10				
Mattapoisett	Hollywoods	Weekly	Enterococci	10				
Mattapoisett	Hollywoods	Weekly	Enterococci	11	1	500	500	
Mattapoisett	Land Trust Reservation	Weekly	Enterococci	11				
Mattapoisett	Leisure Shores	Weekly	Enterococci	10	1	360	360	1
Mattapoisett	Mattapoisett Shores Association	Weekly	Enterococci	11	1	500	500	1
Mattapoisett	Ned's Point	Twice	Enterococci	2				
Mattapoisett	Peases Point	Weekly	Enterococci	10				
Mattapoisett	Point Connett	Weekly	Enterococci	10				
Mattapoisett	Town Beach	Weekly	Enterococci	13	2	128	500	1
Nahant	Black Rock	Weekly	Enterococci	12				
Nahant	Canoe	Weekly	Enterococci	12				
Nahant	Nahant Beach (DCR - DUPR)	Weekly	Enterococci	15				
Nahant	Nahant Beach (DCR - DUPR)	Weekly	Enterococci	15	2	110	315	
Nahant	Nahant Beach (DCR - DUPR)	Weekly	Enterococci	15				
Nahant	Nahant Beach (DCR - DUPR)	Weekly	Enterococci	15				
Nahant	Short	Weekly	Enterococci	12	1	410	410	1
Nahant	Tudor	Weekly	Enterococci	12	1	108	108	1
Nantucket	40th Pole 1	Weekly	Enterococci	12	1	106	106	1
Nantucket	40th Pole 2	Weekly	Enterococci	12	1	108	108	1
Nantucket	Children's	Weekly	Enterococci	11				
Nantucket	Cisco	Monthly	Enterococci	4				
Nantucket	Cliffside	Monthly	Enterococci	4				
Nantucket	Dionis	Weekly	Enterococci	11				
Nantucket	Jetties	Monthly	Enterococci	4				
Nantucket	Madaket	Monthly	Enterococci	4				

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Nantucket	Miacomet	Monthly	Enterococci	5				
Nantucket	Sconset 1	Weekly	Enterococci	11				
Nantucket	Sconset 2	Weekly	Enterococci	11				
Nantucket	Sewerbeds	Monthly	Enterococci	4				
Nantucket	Surfside 1	Monthly	Enterococci	4				
Nantucket	Surfside 2	Monthly	Enterococci	4				
Nantucket	Warren's Landing	Monthly	Enterococci	4				
Nantucket	Washing Pond	Monthly	Enterococci	4				
Nantucket	Washington Street	Weekly	Enterococci	11				
New Bedford	400 North	Weekly	Enterococci	12				
New Bedford	400 South	Weekly	Enterococci	13				
New Bedford	Davy's Locker	Weekly	Enterococci	12				
New Bedford	J. Beach	Weekly	Enterococci	13	1	210	210	1
New Bedford	Kids Beach	Weekly	Enterococci	13	1	126	126	1
New Bedford	O'Tools	Weekly	Enterococci	12				
New Bedford	Squid	Weekly	Enterococci	12				
New Bedford	Tabor Park South	Weekly	Enterococci	14	1	480	480	1
New Bedford	Tower 1	Weekly	Enterococci	15	3	110	500	2
New Bedford	Tower 4	Weekly	Enterococci	14	1	250	250	1
Newbury	Plum Island	Monthly	Enterococci	4				
Newburyport	Plum Island	Biweekly	Enterococci	6				
Newburyport	Plum Island	Biweekly	Enterococci	6				
Newburyport	Plum Island	Biweekly	Enterococci	6				
Newburyport	Plum Island	Biweekly	Enterococci	6				
Oak Bluffs	Eastville Town Beach - Drawbridge	Weekly	Enterococci	12				
Oak Bluffs	Eastville Town Beach - Harbor	Weekly	Enterococci	12				
Oak Bluffs	Joseph Sylvia State Beach	Weekly	Enterococci	12				
Oak Bluffs	Joseph Sylvia State Beach	Weekly	Enterococci	10				
Oak Bluffs	Lagoon Pond Herring Run	Weekly	Enterococci	12				
Oak Bluffs	Marinelli (Jetty) Beach	Weekly	Enterococci	12				
Oak Bluffs	Pay Beach	Weekly	Enterococci	3				
Oak Bluffs	Pay Beach	Weekly	Enterococci	12				
Oak Bluffs	Sailing Camp Park	Weekly	Enterococci	12				
Orleans	Kent's Point	Weekly	Enterococci	9				
Orleans	Little Inn at Pleasant Bay	Weekly	Enterococci	12				
Orleans	Meeting House Pond	Weekly	Enterococci	7				

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Orleans	Nauset	Monthly	Enterococci	4				
Orleans	Paw Wah Pond	Weekly	Enterococci	7				
Orleans	Pleasant Bay	Weekly	Enterococci	7				
Orleans	Priscilla's Landing	Weekly	Enterococci	7				
Orleans	Quanset Harbor Club Association	Weekly	Enterococci	12				
Orleans	Rock Harbor	Weekly	Enterococci	15	2	400	400	1
Orleans	Skaket Beach	Weekly	Enterococci	9				
Orleans	Skaket Beach Condominiums	Weekly	Enterococci	12				
Orleans	Town Cove	Weekly	Enterococci	15	2	120	360	1
Plymouth	Nelson Street	Weekly	Enterococci	11				
Plymouth	Plymouth	Weekly	Enterococci	11				
Plymouth	Plymouth	Weekly	Enterococci	11	1	115	115	
Plymouth	Plymouth	Weekly	Enterococci	11	1	148	148	
Plymouth	White Horse	Weekly	Enterococci	11				
Plymouth	White Horse	Weekly	Enterococci	11				
Provincetown	29 Commercial Street	Weekly	Enterococci	15	2	206	324	2
Provincetown	333 Commercial Street	Weekly	Enterococci	15	2	226	370	2
Provincetown	451 Commerical Street	Weekly	Enterococci	14	1	316	316	1
Provincetown	593 Commercial Street	Weekly	Enterococci	13				
Provincetown	637 Commercial Street	Weekly	Enterococci	13				
Provincetown	Atkins Lane	Weekly	Enterococci	15	1	426	426	1
Provincetown	Atlantic Avenue	Weekly	Enterococci	14	1	128	128	
Provincetown	Court Street	Weekly	Enterococci	14	1	226	226	
Provincetown	Herring Cove (National)	Weekly	Enterococci	12				
Provincetown	Johnson Street	Weekly	Enterococci	14	1	302	302	1
Provincetown	Kendal Lane	Weekly	Enterococci	14	1	230	230	1
Provincetown	Provincetown Inn Rotary	Weekly	Enterococci	13				
Provincetown	Race Point (National)	Weekly	Enterococci	12				
Provincetown	Race Point (National)	Weekly	Enterococci	12				
Provincetown	Race Point (National)	Weekly	Enterococci	12				
Provincetown	Ryder Street	Weekly	Enterococci	13				
Provincetown	Ryder Street	Weekly	Enterococci	13				
Provincetown	Ryder Street	Weekly	Enterococci	12				
Provincetown	Town Landing - Breakwater	Weekly	Enterococci	13				
Provincetown	Town Landing - Snail Road	Weekly	Enterococci	13				
Provincetown	Town Landing West of Coast Guard	Weekly	Enterococci	17	3	110	400	3

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Provincetown	West End Lot	Weekly	Enterococci	15	2	130	278	1
Quincy	Avalon	Weekly	Enterococci	15	2	154	167	2
Quincy	Broady (Baker)	Weekly	Enterococci	14	1	136	136	1
Quincy	Chikatawbot	Weekly	Enterococci	15	4	123	172	2
Quincy	Delano Ave.	Weekly	Enterococci	13				
Quincy	Edgewater	Weekly	Enterococci	15	2	327	340	2
Quincy	Germantown Firestation	Weekly	Enterococci	13				
Quincy	Heron	Weekly	Enterococci	13				
Quincy	Merrymount	Weekly	Enterococci	13				
Quincy	Mound	Weekly	Enterococci	13				
Quincy	Nickerson	Weekly	Enterococci	14	1	118	118	1
Quincy	Orchard Street	Weekly	Enterococci	14	1	1200	1200	1
Quincy	Parkhurst	Weekly	Enterococci	13				
Quincy	Rhoda	Weekly	Enterococci	17	3	113	309	4
Quincy	Wollaston (DCR - DUPR)	Daily	Enterococci	80	6	122	203	7
Quincy	Wollaston (DCR - DUPR)	Daily	Enterococci	80	2	108	717	6
Quincy	Wollaston (DCR - DUPR)	Daily	Enterococci	78	2	161	187	6
Quincy	Wollaston (DCR - DUPR)	Daily	Enterococci	79	7	121	2010	8
Revere	Revere (DCR - DUPR)	Weekly	Enterococci	15				
Revere	Revere (DCR - DUPR)	Weekly	Enterococci	15				
Revere	Revere (DCR - DUPR)	Weekly	Enterococci	15				
Revere	Revere (DCR - DUPR)	Weekly	Enterococci	15	1	152	152	
Revere	Short (DCR - DUPR)	Weekly	Enterococci	14				
Rockport	Back	Monthly	Enterococci	5				
Rockport	Cape Hedge	Monthly	Enterococci	5				
Rockport	Front Beach	Weekly	Enterococci	14				
Rockport	Long	Monthly	Enterococci	5				
Rockport	Long	Monthly	Enterococci	5				
Rockport	Old Garden	Weekly	Enterococci	14				
Rockport	Pebble	Monthly	Enterococci	5				
Salem	Children's Island - Back	Weekly	Enterococci	13	4	107	3300	2
Salem	Children's Island - Dock	Weekly	Enterococci	12	1	1000	1000	1
Salem	Children's Island - Wally	Weekly	Enterococci	12	2	115	4600	2
Salem	Collins Cove	Weekly	Enterococci	12				
Salem	Dead Horse	Weekly	Enterococci	13	1	110	110	1
Salem	Forest River Point	Weekly	Enterococci	12				

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Salem	Juniper Point	Weekly	Enterococci	12				
Salem	Mackey	Weekly	Enterococci	13	1	464	464	1
Salem	Ocean Avenue	Weekly	Enterococci	14	2	455	555	2
Salem	Osgood	Weekly	Enterococci	14	3	115	573	1
Salem	Pioneer	Weekly	Enterococci	12				
Salem	Steps	Weekly	Enterococci	13	1	113	113	1
Salem	Willow Avenue	Weekly	Enterococci	13	2	131	300	1
Salem	Willows Pier	Weekly	Enterococci	13	1	112	112	
Salem	Winter Island (Waikiki)	Weekly	Enterococci	13	1	123	123	1
Salisbury	Salisbury (DCR - DSPR)	Weekly	Enterococci	15				
Salisbury	Salisbury (DCR - DSPR)	Weekly	Enterococci	15				
Sandwich	East Sandwich	Weekly	Enterococci	12				
Sandwich	Scusset (DCR - DSPR)	Weekly	Enterococci	17	1	220	220	1
Sandwich	Torrey Beach Community Association	Weekly	Enterococci	12				
Sandwich	Town Neck	Weekly	Enterococci	12				
Sandwich	Town Neck	Weekly	Enterococci	15	2	400	400	1
Sandwich	Town Neck (Horizons)	Weekly	Enterococci	12				
Scituate	Egypt	Weekly	Enterococci	11				
Scituate	Humarock	Weekly	Enterococci	11				
Scituate	Minot	Weekly	Enterococci	11				
Scituate	Peggotty	Weekly	Enterococci	11				
Scituate	Sand Hills	Weekly	Enterococci	11				
Scituate	Scituate Lighthouse	Weekly	Enterococci	11				
Somerset	Pearse	Weekly	Enterococci	16	1	2400	2400	1
Swampscott	Eisman's	Weekly	Enterococci	12	1	273	273	1
Swampscott	Fisherman's	Weekly	Enterococci	12	1	182	182	1
Swampscott	Kings	Weekly	Enterococci	13	2	309	330	2
Swampscott	Phillips	Biweekly	Enterococci	5				
Swampscott	Preston	Weekly	Enterococci	12				
Swampscott	Whales	Weekly	Enterococci	12	1	282	282	1
Swansea	Cedar Cove	Weekly	Enterococci	13	1	730	730	1
Swansea	Coles River Club off Harbor Rd	Biweekly	Enterococci	6				
Swansea	Leeside	Biweekly	Enterococci	4				
Swansea	Sandy Beach	Weekly	Enterococci	11				
Swansea	Town Beach	Weekly	Enterococci	11				
Tisbury	Hilman's Point	Weekly	Enterococci	12				

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Tisbury	Lake Street	Weekly	Enterococci	12				
Tisbury	Mink Meadows	Not Monitored	Enterococci					1
Tisbury	Owen Little Way	Weekly	Enterococci	12				
Tisbury	Owen Park	Weekly	Enterococci	12				
Tisbury	Sound @ Wilfred's Pond Reserve	Weekly	Enterococci	12				
Tisbury	Tashmoo Beach	Weekly	Enterococci	12				
Tisbury	Tashmoo Cut	Weekly	Enterococci	12				
Tisbury	Vineyard Harbor Motel	Weekly	Enterococci	11	1	124	124	1
Truro	Ballston	Monthly	Enterococci	4				
Truro	Coast Guard Town	Monthly	Enterococci	4				
Truro	Cold Storage/Pond Village	Monthly	Enterococci	4				
Truro	Corn Hill	Monthly	Enterococci	4				
Truro	Crow's Nest (496 Shore Rd)	Weekly	Enterococci	12				
Truro	Dune's Colony (648 Shore Rd)	Weekly	Enterococci	12				
Truro	Fisher	Monthly	Enterococci	4				
Truro	Great Hollow	Monthly	Enterococci	5				
Truro	Head of the Meadow (National)	Weekly	Enterococci	12				
Truro	Head of the Meadow (Town)	Monthly	Enterococci	4				
Truro	Longnook	Monthly	Enterococci	4				
Truro	Noon's Landing	Weekly	Enterococci	14	1	200	200	1
Truro	Pamet Harbor	Weekly	Enterococci	14	1	200	200	1
Truro	Ryder	Monthly	Enterococci	4				
Truro	Sunset Village (379 Shore Rd)	Weekly	Enterococci	12				
Truro	Town Landing Beach Point	Weekly	Enterococci	14	1	292	292	1
Wareham	Briarwood	Weekly	Enterococci	12				
Wareham	East Boulevard	Weekly	Enterococci	9				
Wareham	Forbes	Weekly	Enterococci	11	1	400	400	1
Wareham	Little Harbor	Weekly	Enterococci	12	1	130	130	1
Wareham	North Boulevard	Weekly	Enterococci	14	2	134	160	2
Wareham	Onset	Weekly	Enterococci	12				
Wareham	Parkwood	Weekly	Enterococci	12				
Wareham	Pinehurst	Weekly	Enterococci	12				
Wareham	Point Independence	Weekly	Enterococci	13	1	138	138	1
Wareham	Riverside Avenue	Weekly	Enterococci	9				
Wareham	Shell Point	Weekly	Enterococci	11				
Wareham	Swift's	Weekly	Enterococci	12				

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Wareham	Swift's Neck	Weekly	Enterococci	13	1	400	400	1
Wellfleet	Burton Baker	Monthly	Enterococci	4				
Wellfleet	Cahoon Hollow	Monthly	Enterococci	4				
Wellfleet	Chequesset Yacht and Country Club	Weekly	Enterococci	11				
Wellfleet	Duck Harbor	Monthly	Enterococci	4				
Wellfleet	Indian Neck	Monthly	Enterococci	4				
Wellfleet	Kellers Corner	Monthly	Enterococci	4				
Wellfleet	Maguires Landing	Monthly	Enterococci	4				
Wellfleet	Marconi	Weekly	Enterococci	12				
Wellfleet	Marconi	Weekly	Enterococci	12				
Wellfleet	Marconi	Weekly	Enterococci	12				
Wellfleet	Mayo	Weekly	Enterococci	13				
Wellfleet	Newcomb Hollow	Monthly	Enterococci	4				
Wellfleet	Omaha Road	Monthly	Enterococci	4				
Wellfleet	Powers Landing	Monthly	Enterococci	4				
Wellfleet	White Crest	Monthly	Enterococci	4				
West Tisbury	Great Pond @ Long Point	Weekly	Enterococci	10	1	158	158	1
West Tisbury	Lambert's Cove Beach	Weekly	Enterococci	12				
West Tisbury	Lambert's Cove Beach	Weekly	Enterococci	12				
West Tisbury	Ocean @ Long Point	Weekly	Enterococci	10				
West Tisbury	Ocean @ Long Point	Weekly	Enterococci	11	1	142	142	1
West Tisbury	Sepiessa Point	Weekly	Enterococci	12				
Westport	Baker's Beach	Weekly	Enterococci	11				
Westport	C & K Club	Weekly	Enterococci	11				
Westport	Cherry & Webb	Monthly	Enterococci	3				
Westport	East Beach	Monthly	Enterococci	3				
Westport	Elephant Rock	Weekly	Enterococci	11				
Westport	Horseneck (DCR - DSPR)	Weekly	Enterococci	14				
Westport	Spindle Rock	Weekly	Enterococci	11				
Westport	Town Beach	Weekly	Enterococci	11				
Weymouth	George E. Lane	Biweekly	Enterococci	7				
Weymouth	Wessagusett (Old Wessagussett)	Biweekly	Enterococci	7				
Winthrop	Donovans	Weekly	Enterococci	12	1	360	360	1
Winthrop	Grandview	Weekly	Enterococci	12				
Winthrop	Halford	Weekly	Enterococci	12	1	318	318	1
Winthrop	Pico	Weekly	Enterococci	12				

Table 19

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Winthrop	Winthrop (DCR - DUPR)	Weekly	Enterococci	15				
Winthrop	Yerrill	Weekly	Enterococci	12				
Yarmouth	Bass River	Weekly	Enterococci	14				
Yarmouth	Bass River	Weekly	Enterococci	14				
Yarmouth	Baxter Avenue	Weekly	Enterococci	13				
Yarmouth	Bay Road	Weekly	Enterococci	13				
Yarmouth	Bayview Street	Weekly	Enterococci	16	2	238	400	1
Yarmouth	Colonial Acres	Weekly	Enterococci	14				
Yarmouth	Colonial Acres	Weekly	Enterococci	14				
Yarmouth	Columbus Avenue	Weekly	Enterococci	13				
Yarmouth	Englewood	Weekly	Enterococci	14	1	400	400	
Yarmouth	Follins Pond	Weekly	Enterococci	14	1	236	236	
Yarmouth	Gray's Beach	Weekly	Enterococci	15	1	164	164	
Yarmouth	Parkers River East	Weekly	Enterococci	14				
Yarmouth	Parkers River West	Weekly	Enterococci	14				
Yarmouth	Seagull (Center)	Weekly	Enterococci	14				
Yarmouth	Seagull (Left)	Weekly	Enterococci	14				
Yarmouth	Seagull (Right)	Weekly	Enterococci	14				
Yarmouth	Seaview Ave. Beach	Weekly	Enterococci	14				
Yarmouth	South Middle	Weekly	Enterococci	13				
Yarmouth	Thatcher Town Park	Weekly	Enterococci	14				
Yarmouth	Wilbur Park	Weekly	Enterococci	14				
Yarmouth	Windmill	Weekly	Enterococci	13				

1 - Multiple instances of beaches may occur due to multiple sampling points.

2 - The number of postings could be greater than the number of single sample exceedances due to the presence of geometric mean exceedances.

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Abington	Island Grove Beach	Weekly	E. coli	10				
Acton	NARA Beach	Weekly	E. Coli	16				
Agawam	Robinson Pond Beach 1	Weekly	Enterococci	17	2	90	136	1
Amesbury	Camp Bauercrest	Weekly	E. Coli	11				
Amesbury	Glen Devin Condominiums	Weekly	E. Coli	15				
Amesbury	Lake Attitash-Dam/Bathing area	Weekly	E. Coli	15				
Amesbury	Lake Gardner-Greatest batherload	Weekly	E. Coli	15				
Amesbury	Whitehall Lake Condominiums-Crowninshield Mgmt.	Weekly	E. Coli	15				
Andover	Pomps Pond - Center	Weekly	E. Coli	11				
Andover	Pomps Pond - Center	Weekly	Fecal Coliform	11				
Andover	Pomps Pond - Left Side	Weekly	E. Coli	12	3	300	700	1
Andover	Pomps Pond - Left Side	Weekly	Fecal Coliform	12				
Andover	Pomps Pond - Right Side	Weekly	E. Coli	11				
Andover	Pomps Pond - Right Side	Weekly	Fecal Coliform	11				
Arlington	Arlington Reservoir	Weekly	E. Coli	11				
Arlington	Medford Boat Club - Lower	Weekly	E. Coli	15	2	248	1780	2
Arlington	Medford Boat Club - Upper	Weekly	E. Coli	13				
Ashburnham	Camp Winnekeag Pond	Weekly	E. Coli	11				
Ashby	Camp Middlesex	Weekly	E. Coli	8				
Ashby	Damon Pond Beach	Weekly	Enterococci	19	5	64	280	4
Ashfield	Ashfield Lake Beach	Weekly	E. coli	16				
Ashland	Ashland Reservoir-Main Beach	Weekly	Enterococci	17	2	72	120	2
Ashland	Camp Winnetaska	Weekly	E. Coli	7				
Ashland	Warren Conference Center	Weekly	E. coli	10				
Athol	Ellis Beach	Weekly	E. Coli	19	2	602	659	1
Athol	Silver Lake	Weekly	E. Coli	17	1	830	830	1
Auburn	Century Sportsmen	Weekly	E. Coli	15				
Ayer	Ayer Town Beach	Weekly	E. Coli	15				
Ayer	Mirror Lake	Weekly	E. Coli	13	1	420	420	1
Barnstable	Bearses Pond	Weekly	E. Coli	13				
Barnstable	Fair Acres Country Day School	Weekly	E. Coli	8				
Barnstable	Garrett's Pond	Weekly	E. Coli	13				
Barnstable	Gooseberry Pond	Weekly	E. Coli	13				
Barnstable	Hamblin Pond	Weekly	E. Coli	20	2	560	640	3
Barnstable	Hathaway Pond	Weekly	E. Coli	13				
Barnstable	Homestead Homeowner's Association	Weekly	E. Coli	12				
Barnstable	Joshua's Pond	Weekly	E. Coli	13				
Barnstable	Long Pond (Centerville)	Weekly	E. Coli	13				
Barnstable	Long Pond Farms Association	Weekly	E. Coli	10				
Barnstable	Lovell's Pond	Weekly	E. Coli	13				
Barnstable	Middle Pond	Weekly	E. Coli	13				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Barnstable	Mystic Lake Race Lane	Weekly	E. Coli	13				
Barnstable	Mystic Lake Sawmill	Weekly	E. Coli	13				
Barnstable	Regency Drive Owners Association	Weekly	E. Coli	4				
Barnstable	Sand Shores Association	Twice per week	E. Coli	25				
Barnstable	Shallow Pond	Weekly	E. Coli	13				
Barnstable	Shubael Pond	Weekly	E. Coli	13				
Barnstable	Wequaquet Heights Association (118 Conners Rd.)	Weekly	E. Coli	12				
Barnstable	Wequaquet Heights Association (Jimmy's Beach)	Weekly	E. Coli	12				
Barnstable	Wequaquet Lake Town	Weekly	E. Coli	13				
Barnstable	Wequaquet Lake Yacht	Weekly	E. Coli	13				
Barnstable	Wianno Club (Fresh-Crystal Lake)	Weekly	Enterococci	12				
Becket	Becket Woods Beach	Weekly	E. Coli	16				
Becket	Becket Woods Dock	Weekly	E. Coli	16				
Becket	Camp Becket Iroquois Beach	Weekly	E. Coli	13				
Becket	Camp Becket Main Beach	Weekly	E. Coli	13				
Becket	Camp Greylock Jr. Beach	Weekly	E. Coli	9				
Becket	Camp Lenox	Biweekly	E. Coli	8				
Becket	Camp Watitoh Beach	Weekly	E. Coli	9				
Becket	Center Lake Estates Beach	Weekly	E. Coli	16				
Becket	Center Pond Beach	Weekly	E. Coli	16				
Becket	Center Pond Beach	Weekly	Total Coliform	8				
Becket	Chimney Corners Beach	Weekly	E. Coli	13				
Becket	Crystal Pond Beach	Weekly	E. Coli	16				
Becket	Excalibur	Biweekly	E. Coli	8				
Becket	Indian Lake - Dock	Weekly	E. Coli	16				
Becket	Indian Lake Large Beach	Weekly	E. Coli	16				
Becket	Indian Lake Small Beach	Weekly	E. Coli	16				
Becket	Indian Lake Small Pond Beach	Weekly	E. Coli	16				
Becket	Lancelot Beach	Biweekly	E. Coli	8				
Becket	Little Robin Beach	Biweekly	E. Coli	8				
Becket	Mountain Grove Beach	Weekly	E. Coli	18				
Becket	Robin Hood #1	Biweekly	E. Coli	8				
Becket	Robin Hood #2	Biweekly	E. Coli	8				
Becket	Shawnee Shore Beach	Weekly	E. Coli	18				
Bedford	Springs Brook Park Bathing Beach - Dock	Weekly	E. Coli	10				
Bedford	Springs Brook Park Bathing Beach - Dock	Weekly	Enterococci	1				
Bedford	Springs Brook Park Bathing Beach - Pad	Weekly	E. Coli	7				
Bedford	Springs Brook Park Bathing Beach - Rivulet	Weekly	E. Coli	9				
Bedford	Springs Brook Park Bathing Beach - Rivulet	Weekly	Enterococci	1				
Belchertown	Lake Arcadia	Weekly	E. Coli	8				
Bellingham	Arcand Park	Weekly	E. Coli	9				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Bellingham	Silver Lake	Weekly	E. Coli	9	1	500	500	1
Billerica	Nutting Lake - Micozzi Beach North	Weekly	E. Coli	13	1	374	374	1
Billerica	Nutting Lake - Micozzi Beach South	Weekly	E. Coli	13				1
Bolton	Bolton Town Beach	Weekly	E. Coli	15				
Bolton	Camp Virginia Beach	Weekly	E. Coli	7				
Bolton	Tom Denny Camp	Weekly	E. Coli	9				
Bourne	Picture Lake	Weekly	E. Coli	13				
Bourne	Queen Sewell Pond	Weekly	E. Coli	13				
Boxford	Stiles Pond - Greatest Batherload	Weekly	E. coli	8				
Braintree	Sunset Lake - Dock	Weekly	E. Coli	14	2	284	384	2
Brewster	Beechwood	Weekly	E. Coli	12				
Brewster	Blueberry Pond	Weekly	E. Coli	12				
Brewster	Cape Cod Sea Camps (Long Pond)	Weekly	E. Coli	12				
Brewster	Cliff Pond - DYS	Weekly	Enterococci	14				
Brewster	Cliff Pond	Weekly	Enterococci	14				
Brewster	Flax Pond	Weekly	Enterococci	14				
Brewster	Greenland Pond	Weekly	E. Coli	12				
Brewster	Long Pond	Weekly	E. Coli	13				
Brewster	Long Pond at Camp Favorite	Weekly	E. Coli	11				
Brewster	Owl Pond	Weekly	E. Coli	12				
Brewster	Seymour Pond	Weekly	E. Coli	13				
Brewster	Sheep Pond	Weekly	E. Coli	13				
Brewster	Sheep Pond Beach (Tupelo Rd.)	Weekly	E. Coli	12				
Brewster	Slough Pond - Kids Camp	Weekly	E. Coli	11				
Brewster	Slough Pond	Weekly	E. Coli	13				
Brewster	Upper Mill Pond	Weekly	E. Coli	13				
Brimfield	Dean Pond Beach	Weekly	Enterococci	15				
Carver	Cooper's Pond	Weekly	E. Coli	17				
Carver	Crystal Lake	Weekly	E. Coli	17	1	310	310	
Carver	John's Pond	Weekly	E. Coli	17				
Carver	Sampson's Pond	Weekly	E. Coli	17				
Charlemont	Cold River Pool	Weekly	Enterococci	17	4	84	600	6
Charlton	Camp Foskett	Weekly	E. Coli	12				
Charlton	Camp Joslin	Weekly	E. Coli	9				
Charlton	Little Nugget	Weekly	E. Coli	10				
Charlton	Prindle Beach	Weekly	E. Coli	10				
Chatham	Goose Pond	Weekly	Enterococci	13				
Chatham	Pilgrim Village	Weekly	Enterococci	11				
Chatham	Schoolhouse Pond	Weekly	Enterococci	14				
Chatham	White Pond	Weekly	Enterococci	15	1	67	67	
Chelmsford	Freeman Lake - Dam	Weekly	E. coli	10	1	420	420	

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Chelmsford	Freeman Lake - Dock	Weekly	E. coli	10				
Chesterfield	Chesterfield Scout Reservation - BSA	Weekly	E. Coli	9				
Chicopee	Chicopee Beach	Weekly	Enterococci	16	1	80	80	1
Clarksburg	Mausert Pond - Day use area beach	Weekly	Enterococci	14	3	220	700	3
Concord	Annursnac Hill Assoc.	Weekly	E. coli	15				
Concord	Silver Hill Assoc	Weekly	E. coli	16	1	390	390	1
Concord	Walden Pond - Main	Weekly	Enterococci	16	1	292	292	1
Concord	Walden Pond - Red Cross	Weekly	Enterococci	16	1	231	231	1
Concord	White Pond - SW Cove	Weekly	E. coli	15				
Concord	White Pond Assoc	Weekly	E. coli	15				
Conway	Conway Swimming Pool	Weekly	E. Coli	9				
Cummington	Shire Village Beach	Weekly	E. Coli	6				
Dennis	Flax Pond	Weekly	E. Coli	13				
Dennis	Princess Beach-Scargo Lake	Weekly	E. Coli	13				
Dennis	Scargo Lake	Weekly	E. Coli	13				
Douglas	Breezy Picnic Grounds	Weekly	E. Coli	14				
Douglas	Lake Manchaug Camping	Weekly	E. Coli	15				
Douglas	Wallum Lake	Weekly	Enterococci	16	1	114	114	1
Douglas	Wallum Lake Terrace	Weekly	E. Coli	15				
Dover	Grossman Beach	Weekly	E. Coli	12				
Dover	Powissett	Weekly	E. Coli	12				
Dracut	Fleur de Lis	Weekly	E. Coli	10				
Dracut	Grove	Weekly	E. Coli	10				
Dracut	Hilltop	Weekly	E. Coli	10				
Dracut	Mascuppic	Weekly	E. Coli	10				
Dracut	Passaconaway	Weekly	E. Coli	10				
Dracut	Peter's Pond	Weekly	E. Coli	10				
Dracut	Richardson	Weekly	E. Coli	10				
Dudley	Merino Pond	Weekly	E. Coli	15	1	340	340	1
Dudley	Merino Pond	Weekly	Total Coliform	1				
East Brookfield	Camp Frank A Day	Weekly	E. Coli	9				
East Brookfield	Lake Lashaway	Weekly	E. Coli	12				1
Eastham	Great Pond	Weekly	E. Coli	13				
Eastham	Herring Pond	Weekly	E. Coli	13				
Eastham	Long Pond (Depot St.)	Weekly	E. Coli	13				
Eastham	Minister's Pond	Weekly	E. Coli	13				
Eastham	Nauset Haven Lakeside Condo (Minister)	Weekly	E. Coli	12				
Eastham	Whispering Pines Condo (Muddy Pond)	Weekly	E. Coli	12				
Eastham	Wiley Park	Weekly	E. Coli	13				
Easton	Swim Area	Weekly	E. coli	9				
Egremont	Prospect Lake Park	Weekly	E. Coli	12				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Erving	Laurel Lake	Weekly	Enterococci	15				
Essex	Camp Menorah	Weekly	E. Coli	10	2	248	880	2
Essex	Centennial Grove	Weekly	E. Coli	14				
Falmouth	Ashumet Pond	Weekly	E. Coli	13				
Falmouth	Ashumet Valley Holly Sands	Weekly	E. Coli	13	1	284	284	1
Falmouth	Cape Cod Camp Resort	Weekly	E. Coli	12				
Falmouth	Coonamessett Pond	Weekly	E. Coli	13				
Falmouth	Grew's Pond	Weekly	E. Coli	13				
Falmouth	Jenkins Pond - Pinecrest	Weekly	E. Coli	12				
Falmouth	Lochstead Association	Weekly	E. Coli	12				
Falmouth	Mares Pond Association	Weekly	E. Coli	12				
Falmouth	Sand Pointe Shores-Rock Hollow	Weekly	E. Coli	12				
Falmouth	Sand Pointe Shores-White Cap	Weekly	E. Coli	12				
Falmouth	Shady Lane HA-Crooked Pond	Weekly	E. Coli	12				
Falmouth	Water-by Estates Association-Flax Pond	Weekly	E. Coli	12				
Florida	Manice Education Center Beach	Weekly	E. coli	16				
Framingham	Cochituate Beach	Weekly	E. Coli	10				
Framingham	Learned Beach	Weekly	E. Coli	11	1	280	280	1
Framingham	Washakum Beach	Weekly	E. Coli	10				
Franklin	Chilson Beach	Weekly	E. Coli	12	5	240	910	1
Freetown	Town Beach	Weekly	E. Coli	9	1	330	330	1
Gardner	Bonnie Brae Day Camp	Weekly	E. Coli	6				
Gardner	Dunn Pond	Weekly	Enterococci	15				
Gardner	Kendall Pond	Weekly	E. Coli	16				
Gardner	P.A.C.C.	Weekly	E. Coli	16				
Georgetown	American Legion Park	Weekly	E. Coli	20	2	270	1700	1
Georgetown	Camp Leslie	Weekly	E. Coli	8				
Goshen	Camp Holy Cross	Weekly	E. Coli	15				
Goshen	Camp Howe	Weekly	E. Coli	14				
Goshen	Hammond Acres	Weekly	E. Coli	16				
Goshen	Upper Highland Lake - Campers Beach	Weekly	Enterococci	16	1	128	128	1
Goshen	Upper Highland Lake - Day use area beach	Weekly	Enterococci	17	2	102	110	2
Grafton	Silver Lake Beach	Weekly	E. Coli	11				
Great Barrington	Green River	Weekly	E. Coli	20	2	328	756	1
Great Barrington	Green River	Weekly	Enterococci	5	2	78	140	
Great Barrington	Lake Mansfield - Town Beach	Weekly	E. Coli	16	1	272	272	
Greenfield	Greenfield Municipal Bathing Beach	Weekly	E. Coli	15				
Groton	Baby Beach Lost Lake	Weekly	E. Coli	15				
Groton	Groton Town Beach	Weekly	E. Coli	15				
Groton	Grotonwood Camp	Weekly	E. Coli	12				
Halifax	17 Lake Street	Weekly	E. Coli	4				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Halifax	Annawon Street	Weekly	E. Coli	14				
Halifax	Cooke's Beach	Weekly	E. Coli	4				
Halifax	Halifax Beach	Weekly	E. Coli	14				
Halifax	Holmes Street	Weekly	E. Coli	14				
Halifax	Lingan Street	Weekly	E. Coli	14				
Halifax	Wamsutta	Weekly	E. Coli	14				
Hanson	Arlene	Weekly	E. Coli	8	1	1600	1600	1
Hanson	Camp Kiwanee	Weekly	E. Coli	11				
Hanson	Cranberry	Weekly	E. Coli	11				
Hanson	Ocean Ave.	Weekly	E. Coli	11				
Hanson	Wilkey's	Weekly	E. Coli	11				
Harvard	Harvard Town Beach	Weekly	E. Coli	12				
Harwich	Aunt Edie's Pond (Sandy Shore Way)	Weekly	E. Coli	12				
Harwich	Buck's Pond	Weekly	E. Coli	13				
Harwich	Great Sands 1	Weekly	E. Coli	12				
Harwich	Great Sands 2	Weekly	E. Coli	12				
Harwich	Great Sands 3	Weekly	E. Coli	12				
Harwich	Hinkley's Pond	Weekly	E. Coli	13				
Harwich	Long Pond Rte 124	Weekly	E. Coli	13				
Harwich	Long Pond-Cahoon St.	Weekly	E. Coli	13				
Harwich	Long Pond-Long Pond Drive	Weekly	E. Coli	13				
Harwich	Robbins Pond	Weekly	E. Coli	13				
Harwich	Sand Pond	Weekly	E. Coli	13				
Harwich	Seymour Pond	Weekly	E. Coli	13				
Harwich	Skinequit Pond	Weekly	E. Coli	13				
Haverhill	Plug's Pond	Weekly	E. coli	10				
Heath	Mohawk Estates - Beach	Weekly	E. coli	16				1
Heath	Mohawk Estates - Inlet	Weekly	E. coli	11				
Heath	Mohawk Estates - Outlet	Weekly	E. coli	7				
Hinsdale	Camp Ashmere Beach	Weekly	E. Coli	13				
Hinsdale	Camp Emerson Beach	Weekly	E. Coli	10				
Hinsdale	Camp Emerson Marina	Weekly	E. Coli	10				
Hinsdale	Camp Emerson Marina	Weekly	Total Coliform	10				
Hinsdale	Camp Romaca - Beach	Weekly	E. Coli	12				
Hinsdale	Camp Romaca - Lagoon	Weekly	E. Coli	3				
Hinsdale	Camp Taconic Beach	Weekly	E. Coli	11				
Hinsdale	Dan Duquette Sports Academy	Weekly	E. Coli	10				
Hinsdale	Plunkett Lake Beach	Weekly	E. Coli	16				
Holden	Camp Kinneywood Beach	Weekly	E. Coli	9	1	319	319	1
Holden	Eagle Lake	Weekly	E. Coli	11				
Holland	Hamilton Reservoir - North	Weekly	E. Coli	15				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Holland	Hamilton Reservoir - South	Weekly	E. Coli	15				
Holland	Holland Pond	Weekly	E. Coli	16				
Holland	Town Beach	Weekly	E. Coli	15				
Holliston	Pleasure Point	Weekly	E. Coli	12				
Holliston	Stoddard	Weekly	E. Coli	12				
Hopkinton	Hopkinton Reservoir-Main Beach	Weekly	Enterococci	17	2	72	78	2
Hopkinton	Hopkinton Reservoir-Upper Beach	Weekly	Enterococci	16	1	84	84	1
Hopkinton	Sandy Beach - Left	Weekly	E. Coli	12				
Hopkinton	Sandy Beach - Middle	Weekly	E. Coli	12				
Hopkinton	Sandy Beach - Right	Weekly	E. Coli	12				
Hubbardston	Comet Pond Beach	Weekly	Enterococci	16	1	108	108	1
Hubbardston	Pinecrest Property Owners Assoc.	Weekly	E. Coli	16				
Hudson	Hudson Centennial Beach	Weekly	E. Coli	13	1	640	640	1
Ipswich	Hood Pond-boat ramp	Weekly	Enterococci	16				
Kingston	Camp Mishannock	Weekly	E. Coli	7				
Lakeville	Big Beach	Weekly	E. Coli	17	2	430	450	2
Lakeville	Clark Shores 3	Weekly	E. Coli	15	1	340	340	1
Lakeville	Clear Pond	Weekly	E. Coli	11				
Lakeville	Heaven Heights	Not Monitored						1
Lakeville	Hemlock Shores	Not Monitored						1
Lakeville	Ted Williams	Twice	E. Coli	2				
Lancaster	Camp Lowe Beach	Weekly	E. Coli	11				
Lancaster	Lancaster Town Beach	Weekly	E. Coli	9				
Lanesborough	Camp Mohawk Beach	Weekly	E. Coli	7				
Lanesborough	Sunrise Beach	Weekly	E. Coli	12				
Lee	Sandy Beach	Weekly	E. Coli	12				
Lenox	Laurel Lake	Weekly	E. Coli	12				
Leominster	Ricker's Kindercamp	Weekly	E. Coli	9				
Lexington	Old Reservoir Swim Area Left #1	Weekly	Enterococci	12				
Lexington	Old Reservoir Swim Area Right #1	Weekly	Enterococci	12				
Littleton	Littleton Town Beach	Weekly	E. Coli	11				
Ludlow	Haviland Pond	Weekly	E. Coli	16	1	520	520	
Ludlow	Haviland Pond - Restrooms	Weekly	E. Coli	17	1	245	245	
Lunenburg	Hickory Hill	Weekly	E. Coli	10				
Lunenburg	Hickory Hills Island Rd.	Weekly	E. Coli	10				
Lunenburg	Lunenburg Town Beach	Weekly	E. Coli	10				
Lunenburg	Shady Point Campground	Weekly	E. Coli	14				
Lynn	Flax Pond - Railing	Weekly	E. Coli	16	5	340	4800	
Lynn	Flax Pond - Rocks	Weekly	E. Coli	16	5	600	2400	
Lynn	Sluice Pond - Briarcliff Lodge	Weekly	E. Coli	16	3	370	4000	
Lynn	Sluice Pond - Four Winds	Weekly	E. Coli	16	2	300	400	

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Marlborough	McDonald Beach	Three times	Fecal Coliform	3				
Marlborough	Memorial - Left	Weekly	E. coli	13	1	310	310	1
Marlborough	Memorial - Middle	Weekly	E. coli	12	1	280	280	1
Marlborough	Memorial - Right	Weekly	E. coli	12				
Marlborough	Rodger's Beach	Three times	Fecal Coliform	3				
Mashpee	Attaquin	Weekly	E. Coli	13				
Mashpee	Camp Farley - Wakeby Pond	Weekly	E. Coli	14	1	548	548	1
Mashpee	Fells Pond	Weekly	E. Coli	12				
Mashpee	John's Pond (Tim's Beach)	Weekly	E. Coli	12				
Mashpee	John's Pond (Briarwood)	Weekly	E. Coli	12				
Mashpee	John's Pond (North)	Weekly	E. Coli	12				
Mashpee	John's Pond (Back Road)	Weekly	E. Coli	13				
Mashpee	John's Pond (Brickyard Road)	Weekly	E. Coli	13				
Mashpee	Mashpee Shores Assoc.	Weekly	E. Coli	12				
Mashpee	Santuit Pond - Bryant's Neck	Weekly	E. Coli	14	1	620	620	1
Mashpee	Santuit Pond - Town Landing	Weekly	E. Coli	13				
Mashpee	Santuit Pond Estate Assoc. - Santuit Pond	Weekly	E. Coli	12				
Mashpee	Trustee's of the Reservation (Mashpee Pond)	Weekly	E. Coli	12				
Mashpee	Trustee's of the Reservation (Wakeby Pond)	Weekly	E. Coli	12				
Medfield	Hinkley	Weekly	E. coli	9				
Medfield	Hinkley	Weekly	Enterococci	9	1	120	120	
Medford	Wrights Pond - Deep End	Weekly	E. Coli	13	1	520	520	
Medford	Wrights Pond - Shallow End	Weekly	E. Coli	14	2	384	880	2
Medway	Choate Pond - Left	Weekly	E. coli	8				1
Medway	Choate Pond - Right	Weekly	E. coli	9				1
Mendon	Town Beach	Weekly	E. Coli	10				
Merrimac	Indian Head Park	Weekly	E. Coli	11				
Methuen	Forest Lake - Center	Weekly	E. Coli	24	2	436	1733	1
Methuen	Forest Lake - Center	Weekly	Total Coliform	21				
Methuen	Forest Lake - North Ramp	Weekly	E. Coli	23	6	388	1300	
Methuen	Forest Lake - North Ramp	Weekly	Total Coliform	22				
Methuen	Forest Lake - Right	Weekly	E. Coli	17				
Methuen	Forest Lake - Right	Weekly	Total Coliform	16				
Methuen	Forest Lake - South Ramp	Weekly	E. Coli	21				
Methuen	Forest Lake - South Ramp	Weekly	Total Coliform	20				
Middleborough	Camp Avoda	Weekly	E. Coli	7				
Middleborough	Camp Yomechas	Weekly	E. Coli	15				
Middleborough	Woods Pond Cabins	Weekly	E. Coli	8				
Middleton	Thunderbridge	Weekly	E. Coli	14	1	1050	1050	1
Milton	DCR - Houghton's Pond @ Bathouse	Weekly	Enterococci	19	1	369	369	1
Monterey	Benedict Pond Beach	Weekly	Enterococci	16	1	160	160	1

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Monterey	Camp Half Moon	Weekly	E. Coli	10				
Monterey	Lake Garfield	Weekly	E. Coli	16				
Mt. Washington	Camp Hi Rock - Bear Rock Beach	Weekly	E. coli	16				
Mt. Washington	Camp Hi Rock - Main Beach	Weekly	E. coli	16				
Nantucket	Miacomet Pond	Weekly	E. Coli	12	1	800	800	1
Nantucket	Sesachacha Pond	Weekly	E. Coli	11				
Natick	Camp Arrowhead	Weekly	E. Coli	10	1	390	390	
Natick	Camp Nonesuch	Weekly	E. Coli	10				
Natick	Cochituate Lake-North Beach	Weekly	Enterococci	17	2	66	1600	2
Natick	Dug Pond - Diving	Weekly	E. Coli	13				
Natick	Dug Pond - Dock	Once	E. Coli	1				
Natick	Dug Pond - Kiddie	Weekly	E. Coli	12	1	680	680	
New Braintree	Camp Putnam	Weekly	E. Coli	6				
New Braintree	Camp Putnam	Weekly	Total Coliform	1				1
Newton	Crystal Lake	Weekly	E. Coli	11				
North Andover	Berry Pond Beach	Weekly	Enterococci	15				
North Andover	Frye Pond Beach	Weekly	Enterococci	15	2	81	254	2
North Andover	Stevens Pond - Right	Weekly	E. Coli	10				
North Attleboro	Falls Pond	Weekly	E. coli	13	2	350	430	2
North Attleboro	Whitings Pond	Weekly	E. coli	18	7	260	1800	4
North Brookfield	Brooks Pond	Weekly	E. Coli	11				
North Brookfield	Camp Atwater	Weekly	E. Coli	12	1	880	880	
Northampton	Musante Beach	Weekly	E. Coli	28				
Northbridge	Camp Hickory Hills	Weekly	E. Coli	9				
Northbridge	Camp Hickory Hills	Weekly	Total Coliform	1				
Northbridge	Memorial Beach	Weekly	E. Coli	8				
Oakham	Lake Dean - Dean Campground	Weekly	E. Coli	14				
Oakham	Lake Dean - Pine Acres Campground	Weekly	E. Coli	15				
Oakham	Treasure Valley Scout - East	Weekly	E. Coli	13				
Oakham	Treasure Valley Scout - West	Weekly	E. Coli	13				
Orange	Camp Selah	Weekly	E. coli	4				1
Orange	Mattawa Beach	Weekly	E. coli	16				
Orleans	Crystal Lake	Weekly	E. Coli	13				
Orleans	Pilgrim Lake	Weekly	E. Coli	13				
Otis	Camp Bonnie Brae	Weekly	E. Coli	10				
Otis	Camp Nawaka	Weekly	E. Coli	11				
Otis	Camp Overflow Beach	Weekly	E. Coli	16				
Otis	Otis Reservoir Beach	Weekly	E. Coli	1				
Otis	Otis Reservoir Beach	Weekly	Enterococci	15				
Otis	Otis Reservoir Beach	Weekly	Total Coliform	1				
Otis	Otis Woodlands - Beach	Weekly	E. Coli	17				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Otis	Otis Woodlands - Beach	Weekly	Enterococci	1				
Otis	Otis Woodlands - Beach	Weekly	Fecal Coliform	1				
Otis	Otis Woodlands - Beach	Weekly	Total Coliform	17				
Otis	Otis Woodlands - Picnic Grove	Weekly	E. Coli	16				
Otis	Otis Woodlands - Picnic Grove	Weekly	Enterococci	1				
Otis	Otis Woodlands - Picnic Grove	Weekly	Fecal Coliform	1				
Otis	Otis Woodlands - Picnic Grove	Weekly	Total Coliform	16				
Otis	Otis Woodlands - Weir	Weekly	E. Coli	17				
Otis	Otis Woodlands - Weir	Weekly	Enterococci	1				
Otis	Otis Woodlands - Weir	Weekly	Fecal Coliform	1				
Otis	Otis Woodlands - Weir	Weekly	Total Coliform	17				
Oxford	Carbunkle Pond	Weekly	E. Coli	12	2	280	400	
Pembroke	Finn Camp	Weekly	E. Coli	14				
Pembroke	Hobomoc Pond	Weekly	E. Coli	14				
Pembroke	Little Sandy	Weekly	E. Coli	14				
Pembroke	Furnace Colony	Weekly	E. Coli	8	3	268	600	1
Pembroke	Oldham	Weekly	E. Coli	18	2	288	520	2
Pembroke	Stetson	Weekly	E. Coli	16	1	520	520	1
Peru	Camp Danbee	Weekly	E. coli	16				
Phillipston	Queen Lake Beach - North	Weekly	Enterococci	14				
Phillipston	Queen Lake Beach - South	Weekly	Enterococci	14	1	92	92	
Pittsfield	Camp St. Michael	Weekly	E. Coli	12	1	238	238	1
Pittsfield	Camp Stevenson/Witawentin	Weekly	E. Coli	13	1	299	299	1
Pittsfield	Country Club of Pittsfield	Weekly	E. Coli	11				
Pittsfield	Lakeside Christian Camp	Weekly	E. Coli	11				
Pittsfield	Lulu Pond Beach	Weekly	Enterococci	16	4	70	600	4
Pittsfield	Onota Lake - Dock	Weekly	E. Coli	15				
Pittsfield	Onota Lake - Burbank Park	Weekly	E. Coli	20	5	260	2400	2
Pittsfield	Onota Lake - Pavillion	Weekly	E. Coli	15				
Pittsfield	Onota Lake - Beach	Weekly	E. Coli	15				
Pittsfield	Pontoosuc Lake - Dock	Weekly	E. Coli	11				
Pittsfield	Pontoosuc Lake - Pines	Weekly	E. Coli	11				
Pittsfield	Pontoosuc Lake - Beach	Weekly	E. Coli	11				
Plainfield	Plainfield Pond	Biweekly	E. Coli	8				
Plymouth	Barrett Pond	Weekly	Enterococci	14				
Plymouth	Bloody Pond - Baird Center	Weekly	E. Coli	12				
Plymouth	Blueberry Hill Camp - Curlew Pond	Weekly	E. Coli	12				
Plymouth	Camp Bournedale - Great Herring Pond	Weekly	E. Coli	10				
Plymouth	Camp Cachalot	Weekly	E. Coli	13	1	430	430	
Plymouth	Camp Clark YMCA - Hyles Pond	Weekly	E. Coli	12				
Plymouth	Camp Massasoit - Elbow Pond	Weekly	E. Coli	10				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Plymouth	Camp Squanto	Weekly	E. Coli	8				
Plymouth	Charge Pond	Weekly	Enterococci	14				
Plymouth	College Pond Day Use	Weekly	Enterococci	14				
Plymouth	Curlew Pond	Weekly	Enterococci	14				
Plymouth	Ellis Haven - Ellis Pond	Weekly	E. Coli	13				
Plymouth	Ellis Haven - Swimming Hole	Weekly	E. Coli	13				
Plymouth	Fearing Pond 1	Weekly	Enterococci	14				
Plymouth	Fearing Pond 2	Weekly	Enterococci	13				
Plymouth	Fresh Pond - End Pond	Weekly	E. Coli	11				
Plymouth	Fresh Pond - Mid Pond	Weekly	E. Coli	11				
Plymouth	Indian Head	Weekly	E. Coli	12				
Plymouth	Morton Park - Left	Weekly	E. Coli	11				
Plymouth	Morton Park - Right	Weekly	E. Coli	11				
Plymouth	Pinewood Camp - Camphouse Beach	Weekly	E. Coli	12				
Plymouth	Pinewood Camp - Crew Dock	Weekly	E. Coli	12				
Plymouth	Pinewood Camp - Pinecones Beach	Weekly	E. Coli	12				
Plymouth	Pinewood Lodge - Fresh Meadow	Weekly	E. Coli	12				
Plymouth	Plymouth Estates	Biweekly	E. Coli	6				
Plymouth	Sandy Pond Campground	Weekly	E. Coli	12				
Plymouth	Wind-in-the-Pines Camp	Weekly	E. Coli	8				
Randolph	Ponkapoag Pond	Weekly	E. Coli	12				
Richmond	Camp Marion White	Weekly	E. Coli	16				
Richmond	Camp Russell	Weekly	E. Coli	15				
Richmond	Richmond Shores - East	Weekly	E. Coli	16				
Richmond	Richmond Town Beach	Weekly	E. Coli	15				
Rochester	Perry's Camp	Weekly	Enterococci	14	3	70	500	3
Rochester	Snipituit Pond	Weekly	Enterococci	13	2	264	500	2
Rockland	Hartstuff Park	Weekly	Enterococci	7	1	115	115	1
Rowe	Rowe Beach - Center	Weekly	E. Coli	19	5	378	1950	
Rowe	Rowe Beach - Inlet	Weekly	E. Coli	11	2	328	403	
Rowe	Rowe Beach - Right	Weekly	E. Coli	19	7	313	2400	
Royalston	St. Laurent Camp	Biweekly	E. Coli	8				
Royalston	St. Laurent Camp	Biweekly	Enterococci	8				
Royalston	Tully Lake Campground	Weekly	E. Coli	17	1	480	480	
Russell	H.A. Moses Beach	Weekly	E. coli	9				
Rutland	Whitehall Pond Beach	Weekly	Enterococci	15				
Sandisfield	York Lake Beach	Weekly	Enterococci	16	2	600	600	1
Sandwich	Camp Burgess	Weekly	E. Coli	6				
Sandwich	Camp Good News	Weekly	E. Coli	12				
Sandwich	Camp Hayward	Weekly	E. Coli	6				
Sandwich	Dunroamin Park & Cottages	Weekly	E. Coli	12				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Sandwich	Hoxie Pond	Weekly	E. Coli	13				
Sandwich	Lakefield Farms Trust	Weekly	E. Coli	12				
Sandwich	Lakewood Hills Property Owners Assoc.	Weekly	E. Coli	13	1	500	500	1
Sandwich	Lawrence Pond	Weekly	E. Coli	13				
Sandwich	Lawrence Pond Mobile Home Park	Weekly	E. Coli	12				
Sandwich	Peter's Pond Park (boat ramp)	Weekly	E. Coli	13				
Sandwich	Peter's Pond Town Park 1	Weekly	E. Coli	13				
Sandwich	Pimlico Pond	Weekly	E. Coli	13				
Sandwich	Rolling Ridge Homeowners Assoc.-Lawrence Pond	Weekly	E. Coli	12				
Sandwich	Snake Pond	Weekly	E. Coli	13				
Sandwich	Triangle Pond	Weekly	E. Coli	13				
Sandwich	Wakeby Pond	Weekly	E. Coli	13				
Saugus	DCR - Pearce Lake @ Breakheart	Weekly	Enterococci	15				
Saugus	DCR - Pecham Pond @ Camp Nihan	Weekly	Enterococci	15	1	75	75	1
Savoy	North Pond Beach	Weekly	Enterococci	17	3	100	300	2
Savoy	South Pond Beach	Weekly	Enterococci	18	3	88	600	3
Sharon	Camp Gan Israil Beach	Weekly	E. Coli	10	2	244	280	2
Sharon	Camp Gannett Beach	Weekly	E. Coli	9				
Sharon	Camp Wonderland Beach	Weekly	E. Coli	10				
Sharon	Town Beach - Boat Landing	Twice per week	E. Coli	11				
Sharon	Town Beach - Concession	Twice per week	E. Coli	11				
Sharon	Town Beach - Docks	Twice per week	E. Coli	25				
Sharon	Town Beach-Boat Landing Area	Twice per week	E. Coli	25				
Sheffield	Berkshire School Beach	Weekly	E. coli	16				
Sherborn	Farm Pond	Weekly	E. coli	13				
Shrewsbury	Sunset Beach	Weekly	E. Coli	12				
Shrewsbury	Sunset Beach	Weekly	Total Coliform	12				
Shutesbury	Lake Wyola	Weekly	Enterococci	16	1	170	170	1
Southwick	South Pond Beach - North	Weekly	E. Coli	10				
Spencer	Camp Laurelwood	Weekly	E. Coli	13				
Spencer	Camp Marshall - Thompson	Weekly	E. Coli	13	1	640	640	1
Spencer	Luther Hill Park	Weekly	E. Coli	12	1	720	720	1
Springfield	Bass Pond - Left	Weekly	Enterococci	10				
Springfield	Bass Pond - Right	Weekly	Enterococci	10				
Springfield	Camp Wilder - Left	Weekly	Enterococci	7	1	200.5	200.5	
Springfield	Camp Wilder - Right	Weekly	Enterococci	7	1	200.5	200.5	
Springfield	Five Mile Pond - Left	Weekly	E. Coli	2				
Springfield	Five Mile Pond - Left	Weekly	Enterococci	15				
Springfield	Five Mile Pond - Right	Weekly	E. Coli	2				
Springfield	Five Mile Pond - Right	Weekly	Enterococci	15				
Springfield	Knights of Columbus - Left	Weekly	Enterococci	10				

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Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Springfield	Knights of Columbus - Right	Weekly	Enterococci	10				
Springfield	Lake Lorraine	Weekly	Enterococci	18	3	72	80	2
Springfield	Loon Pond - Left	Weekly	Enterococci	5	1	200.5	200.5	
Springfield	Loon Pond - Right	Weekly	Enterococci	4				
Springfield	Paddle Club - Left	Weekly	Enterococci	10				
Springfield	Paddle Club - Right	Weekly	Enterococci	10				
Sterling	Lake Waushacum #1	Weekly	E. Coli	8				
Stockbridge	Beachwood Assoc. - Stockbridge Bowl	Weekly	E. Coli	16				
Stockbridge	Berkshire Country Day School	Weekly	E. Coli	8				
Stockbridge	Camp Mahkeenac	Weekly	E. Coli	16				
Stockbridge	Kripalu	Weekly	E. Coli	16				
Stockbridge	Sports School Day Camp	Weekly	E. Coli	7				
Stockbridge	Stockbridge Bowl	Weekly	E. Coli	12				
Stockbridge	White Pines Condos	Weekly	E. Coli	16				
Stoughton	Ames Pond	Weekly	E. Coli	11	1	1100	1100	
Stow	Lake Boone	Weekly	E. Coli	11				
Sturbridge	Main Beach - Walker Pond Assoc.	Weekly	E. Coli	14	1	350	350	
Sturbridge	Oak Cove - Walker Pond Assoc.	Weekly	E. Coli	13				
Sturbridge	Outdoor World Beach	Weekly	E. Coli	14	4	400	2000	
Sturbridge	Streeter Point	Weekly	Enterococci	16	1	80	80	1
Sturbridge	Sturbridge Host Hotel	Weekly	E. Coli	16				
Sturbridge	Sturbridge Recreation - Cedar Pond	Weekly	E. Coli	11				
Sturbridge	Wells State Park	Weekly	Enterococci	15				
Sutton	Camp Blanchard	Weekly	E. Coli	9				
Sutton	Camp Marion	Weekly	E. Coli	12				
Sutton	King's Campground	Weekly	E. Coli	16				
Sutton	Sutton Falls Camp	Weekly	E. Coli	16				
Taunton	Campers Beach / Middle Pond	Weekly	Enterococci	15	1	228	228	1
Taunton	Watsons Pond	Weekly	Enterococci	14				
Templeton	Beamans Pond	Weekly	Enterococci	15				
Templeton	Beamans Pond Campground	Weekly	Enterococci	15				
Templeton	Pinewood Shores	Weekly	Enterococci	12	6	80	1716	1
Templeton	Templeton Fish and Game Club	Weekly	Enterococci	14	4	64	810	
Tolland	Camp Kinderland Beach	Weekly	E. Coli	10				
Tolland	Camp Timbertrails	Weekly	E. Coli	12				
Topsfield	Hood's Pond	Weekly	E. Coli	9				
Townsend	Pearl Hill Pond Beach	Weekly	Enterococci	17	3	114	160	2
Tyngsborough	Town	Weekly	E. Coli	17				
Tyringham	Tyringham Park Beach	Weekly	E. coli	16	1	397	397	
Upton	Pratt Pond	Weekly	E. Coli	12	1	320	320	1
Upton	Taft Pond Beach	Weekly	E. Coli	11				

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Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Upton	Wildwood Pond Beach	Weekly	E. Coli	11				
Uxbridge	Buffumville Lake	Weekly	E. Coli	16				
Uxbridge	Fairwoods	Weekly	E. Coli	15	1	240	240	1
Uxbridge	Pout Pond	Weekly	E. Coli	9	1	270	270	1
Uxbridge	West Hill Park	Weekly	E. Coli	16				
Wales	Lake Land	Weekly	E. Coli	12				
Wales	Lake Land	Weekly	Total Coliform	1				
Wales	Sichols	Weekly	E. Coli	13	1	410	410	1
Wales	Sichols	Weekly	Total Coliform	1				
Wales	Town Beach	Weekly	E. Coli	12				
Wales	Town Beach	Weekly	Total Coliform	1				
Walpole	Sharon Country Day Camp Brook	Weekly	E. Coli	10				
Walpole	Sharon Country Day Camp Pond	Weekly	E. Coli	10	1	390	390	
Wareham	Glen Charlie at Shangri-La	Weekly	E. Coli	12				
Wareham	White Island Association	Weekly	E. Coli	10				
Warren	Comin's Pond	Weekly	E. Coli	15				
Wayland	Lake Cochituate - Left Buoy (deep)	Weekly	E. Coli	14				
Wayland	Lake Cochituate - Left Shallow	Weekly	E. Coli	15				
Wayland	Lake Cochituate - Middle	Weekly	E. Coli	15				
Wayland	Lake Cochituate - Right Shallow	Weekly	E. Coli	15				
Webster	Beacon Park	Weekly	E. Coli	14				
Webster	Beacon Park	Weekly	Total Coliform	1				
Webster	Birch Island	Weekly	E. Coli	15				
Webster	Birch Island	Weekly	Total Coliform	1				
Webster	Colonial Park	Weekly	E. Coli	15				
Webster	Colonial Park	Weekly	Total Coliform	1				
Webster	Indian Ranch	Weekly	E. Coli	18	1	244	244	1
Webster	Indian Ranch	Weekly	Total Coliform	1				
Webster	Kildeer Island	Weekly	E. Coli	15	1	700	700	1
Webster	Lakeside	Weekly	E. Coli	17	1	308	308	1
Webster	Lakeside	Weekly	Total Coliform	1				
Webster	Memorial Beach #1	Weekly	E. Coli	15				
Webster	Memorial Beach #1	Weekly	Total Coliform	1				
Webster	Memorial Beach #2	Weekly	E. Coli	10				
Webster	Memorial Beach #2	Weekly	Total Coliform	1				
Webster	Nipmuc Cove	Weekly	E. Coli	8				
Webster	Nipmuc Cove	Weekly	Total Coliform	1				
Webster	Treasure Island	Weekly	E. Coli	15				
Webster	Treasure Island	Weekly	Total Coliform	1				
Wellesley	Morses Beach - Shallow	Weekly	E. Coli	11				
Wellfleet	Duck Pond	Weekly	E. Coli	13				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Wellfleet	Dyer Pond	Weekly	E. Coli	13				
Wellfleet	Great Pond	Weekly	E. Coli	13				
Wellfleet	Gull Pond	Weekly	E. Coli	13				
Wellfleet	Gull Pond (2)	Weekly	E. Coli	13				
Wellfleet	Higgins Pond	Weekly	E. Coli	13				
Wellfleet	Long Pond	Weekly	E. Coli	13				
Wellfleet	Spectacle Pond	Weekly	E. Coli	11				
Wendell	Ruggles Pond	Weekly	Enterococci	6				
Wenham	Gull Pond	Weekly	E. Coli	6				
Wenham	Pleasant Street Pond	Weekly	E. Coli	6				
West Brookfield	Lake Wickabog - Main Beach	Weekly	E. Coli	15				
West Stockbridge	Card Pond Beach	Weekly	E. Coli	16				
West Stockbridge	Crane Lake Camp	Weekly	E. Coli	12				
West Tisbury	Long Cove (fresh)	Weekly	E. coli	10	1	488	488	1
West Tisbury	Seth's Pond Beach #1	Weekly	E. coli	13	1	260	260	1
West Tisbury	Seth's Pond Cove #2 (Focus)	Weekly	E. coli	13				
West Tisbury	Tisbury Great Pond	Weekly	Enterococci	11				
Westborough	Lake Chauncy Beach #1	Weekly	E. Coli	11				
Westfield	Kingsley	Weekly	Enterococci	21	6	120	4300	5
Westfield	Lambert's	Weekly	Enterococci	15				
Westford	American Legion	Weekly	E. Coli	15				
Westford	East Boston Camps - Boys Beach	Weekly	E. Coli	15				
Westford	East Boston Camps - Day Care	Weekly	E. Coli	14				
Westford	East Boston Camps - Girls Beach	Weekly	E. Coli	11				
Westford	Edwards Town Beach	Weekly	E. Coli	19	1	300	300	1
Westford	Forge Village Beach	Weekly	E. Coli	15				
Westford	Lakeside Meadows	Weekly	E. Coli	15				
Westford	Marylou's Beach - NIA Beach	Weekly	E. Coli	16				
Westford	Nashoba Ski Area - Day Campers Beach	Weekly	E. Coli	15				
Westford	Nashoba Ski Area - Swim Club Beach	Weekly	E. Coli	15				
Westford	North Beach - NIA Beach	Weekly	E. Coli	15				
Westford	Sandy Beach - NIA Beach	Weekly	E. Coli	15				
Westford	Wymans Campers Beach	Twice	E. Coli	2				
Westford	Wymans Main Beach - North	Weekly	E. Coli	15				
Westford	Wymans Main Beach - South	Weekly	E. Coli	15				
Westminster	Crocker Pond	Weekly	E. Coli	16				
Westminster	Crow Hill Pond Beach	Weekly	Enterococci	15				
Westminster	Wyman Pond	Weekly	E. Coli	16				
Weston	River Day Camp	Weekly	E. Coli	10				
Weston	Valley Pond	Weekly	E. Coli	15				
Westport	Sawdy Pond	Weekly	E. coli	11				

Table 20

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2007.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedance	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Westwood	Membership Beach - Middle	Weekly	E. Coli	16				
Westwood	Membership Beach - North	Weekly	E. Coli	17				
Westwood	Membership Beach - South	Weekly	E. Coli	17				
Westwood	North Beach - Middle	Weekly	E. Coli	18				
Westwood	North Beach - North	Weekly	E. Coli	19				
Westwood	North Beach - South	Weekly	E. Coli	19				
Wilbraham	9 Mile Pond	Weekly	E. Coli	10				
Wilbraham	Spec Pond Beach	Weekly	E. Coli	10				
Williamstown	Margaret Lindley Park	Biweekly	E. Coli	8				
Wilmington	Baby Beach	Weekly	E. Coli	12				
Wilmington	Town Beach - Center	Weekly	E. Coli	12				1
Wilmington	Town Beach - Right	Weekly	E. Coli	11				1
Winchendon	Lake Dennison State Park (Day Use)	Weekly	Enterococci	16	1	72	72	1
Winchendon	Lake Dennison State Park (North Camp)	Weekly	Enterococci	15				
Winchester	Sandy Beach @ Upper Mystic	Weekly	Enterococci	16	1	87	87	1
Winchester	Wedge Pond - North	Weekly	Enterococci	10	1	93	93	
Winchester	Wedge Pond - South	Weekly	Enterococci	7				
Windsor	Westfield River Beach	Weekly	Enterococci	10	2	70	420	2
Worcester	Bell Pond Beach	Weekly	E. Coli	7				
Worcester	Coes Pond Hillside	Weekly	E. Coli	5				
Worcester	Coes Pond Mill St. Beach	Weekly	E. Coli	7				
Worcester	Indian Lake Public Beach	Weekly	E. Coli	7				
Worcester	Indian Lake Shore Park	Weekly	E. Coli	7				
Worcester	Lake Quinsigamond-Lake Park Beach	Weekly	Enterococci	18	2	176	320	3
Worcester	Lake Quinsigamond-Regatta Point Beach	Weekly	Enterococci	18	3	74	126	2
Wrentham	Lake Archer	Weekly	E. Coli	8				
Wrentham	Lake Pearl Park Beach	Weekly	E. Coli	15	1	720	720	1
Wrentham	Sweatt Beach	Weekly	E. Coli	10				
Yarmouth	Big Sandy Pond	Weekly	E. Coli	12				
Yarmouth	Camp Greenough - Boy Scouts	Weekly	E. Coli	6				
Yarmouth	Dennis Pond	Weekly	E. Coli	13				
Yarmouth	Elijah's Pond, Camp Wingate	Weekly	E. Coli	12				
Yarmouth	Flax Pond	Weekly	E. Coli	13				
Yarmouth	Horse Pond	Weekly	E. Coli	13				
Yarmouth	Horse Pond - Halcyon Condos	Weekly	E. Coli	12				
Yarmouth	Little Sandy Pond	Weekly	E. Coli	13				
Yarmouth	Long Pond - Indian	Weekly	E. Coli	13				
Yarmouth	Long Pond - Lyman	Weekly	E. Coli	13				

1 - Multiple instances of beaches may occur due to multiple sampling points.

2 - The number of postings could be greater than the number of single sample exceedances due to the presence of geometric mean exceedances.

Table 21

Exceedances Reported Based on the Number of Days Since Last Rainfall at Massachusetts Public and Semi-public Bathing Beaches During the 2007 Season

Marine beaches		
Number of Days Since Rain	**Number of Exceedances**	**%**
0	178	72.1%
1	20	8.1%
2	20	8.1%
3	7	2.8%
4	5	2.0%
5	7	2.8%
6	1	0.4%
7	7	2.8%
8	1	0.4%
9	0	0.0%
10	0	0.0%
11	1	0.4%
Indeterminant	0	0.0%
Total	247	100.0%
Freshwater beaches		
0	136	57.6%
1	36	15.3%
2	26	11.0%
3	11	4.7%
4	6	2.5%
5	5	2.1%
6	0	0.0%
7	2	0.8%
8	1	0.4%
9	0	0.0%
10	0	0.0%
16	1	0.4%
Indeterminant	12	5.1%
Total	236	100.0%

Table 22

Comparison of 2006 Top 10 Marine Beaches in terms of number of single sample exceedances versus sampling events to its respective 2007 data.

2006 Marine Beach Data

Community	Beach	Indicator Type	# of Tests[1]	# Exceedances	Range of Exceedances	% of Samples Exceeding Standard
Chatham	Cockle Cove Creek[2] (parking lot)	Enterococci	15	10	175-1670	66.7%
Chatham	Cockle Cove Creek[2] (ridgevale)	Enterococci	18	11	120-2240	61.1%
Chatham	Bucks Creek	Enterococci	20	10	122-1290	50.0%
Salem	Children's Island - Back	Enterococci	10	4	116-420	40.0%
Falmouth	Shorewood Beach Association	Enterococci	19	7	116-376	36.8%
Salem	Ocean Avenue	Enterococci	15	5	110-4700	33.3%
Provincetown	Town Landing West of Coast Guard	Enterococci	17	5	108-400	29.4%
Dartmouth	Moses Smith Creek	Enterococci	11	3	180-370	27.3%
Marion	Oakdale Avenue	Enterococci	11	3	154-9800	27.3%
Mattapoisett	Town Beach	Enterococci	11	3	396-508	27.3%

2007 Marine Beach Data

Community	Beach	Indicator Type	# of Tests	# Exceedances	Range of Exceedances	% of Samples Exceeding Standard
Chatham	Cockle Cove Creek[2] (parking lot)	Enterococci	14	4	216-1346	28.6%
Chatham	Cockle Cove Creek[2] (ridgevale)	Enterococci	16	2	124-792	12.5%
Chatham	Bucks Creek	Enterococci	16	1	416	6.3%
Salem	Children's Island - Back	Enterococci	13	4	107-3300	30.8%
Falmouth	Shorewood Beach Association	Enterococci	21	10	106-400	47.6%
Salem	Ocean Avenue	Enterococci	14	2	455-555	14.3%
Provincetown	Town Landing West of Coast Guard	Enterococci	17	3	110-400	17.6%
Dartmouth	Moses Smith Creek	Enterococci	12	2	115-340	16.7%
Marion	Oakdale Avenue	Enterococci	11	1	246	9.1%
Mattapoisett	Town Beach	Enterococci	13	2	128-500	15.4%

1 - Only beaches with 6 or more samples during the season were considered for inclusion

2 - Beach closed during 2006 and 2007 Beach Seasons

Table 23

Comparison of 2006 Top 10 Freshwater Beaches in terms of number of single sample exceedances versus sampling events to its respective 2007 data.

2006 Freshwater Beach Data

Community	Beach	Indicator Type	# of Tests[1]	# Exceedances	Range of Exceedances	% of Samples Exceeding Standard
Lynn	Flax Pond - Railing[2]	E. Coli	6	4	470-2000	66.7%
Lynn	Flax Pond - Rocks[2]	E. Coli	6	4	270-1690	66.7%
Franklin	Chilson Beach	E. Coli	13	6	280-980	46.2%
Hanson	Ocean Ave.	E. Coli	10	4	340-2900	40.0%
Charlemont	Cold River Pool	Enterococci	21	8	68-150	38.1%
Freetown	Town Beach	E. Coli	11	4	340-660	36.4%
Wellesley	Morses Beach - Shallow	E. Coli	15	5	260-1400	33.3%
Pittsfield	Lulu Pond Beach	Enterococci	19	6	66-600	31.6%
Southwick	South Pond Beach - North	E. Coli	10	3	272-400	30.0%
Winchester	Sandy Beach @ Upper Mystic	Enterococci	27	8	70-785	29.6%

2007 Freshwater Beach Data

Community	Beach	Indicator Type	# of Tests	# Exceedances	Range of Exceedances	% of Samples Exceeding Standard
Lynn	Flax Pond - Railing[2]	E. Coli	16	5	340-4800	31.3%
Lynn	Flax Pond - Rocks[2]	E. Coli	16	5	600-2400	31.3%
Franklin	Chilson Beach	E. Coli	12	5	240-910	41.7%
Hanson	Ocean Ave.	E. Coli	11	0	---	0.0%
Charlemont	Cold River Pool	Enterococci	17	4	84-600	23.5%
Freetown	Town Beach	E. Coli	9	1	330	11.1%
Wellesley	Morses Beach - Shallow	E. Coli	11	0	---	0.0%
Pittsfield	Lulu Pond Beach	Enterococci	16	4	70-600	25.0%
Southwick	South Pond Beach - North	E. Coli	10	0	---	0.0%
Winchester	Sandy Beach @ Upper Mystic	Enterococci	16	1	87	6.3%

1 - Only beaches with 6 or more samples during the season were considered for inclusion

2 - Beach closed during 2006 and 2007 Beach Seasons

X. FIGURES

Figure 1: MDPH Public Beach Notification Website: statewide map

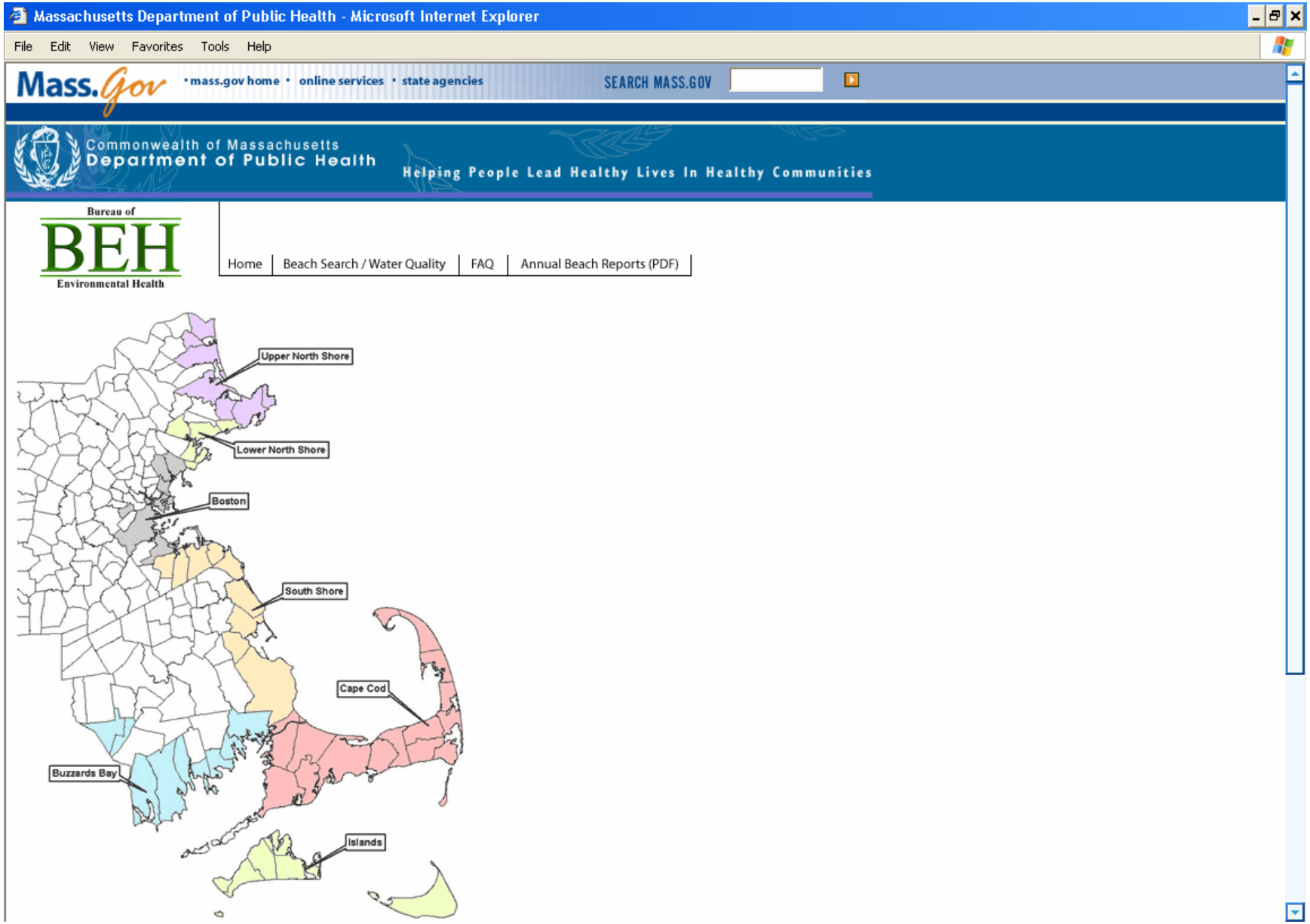


Figure 2: MDPH Public Beach Notification Website: regional map of Cape Cod

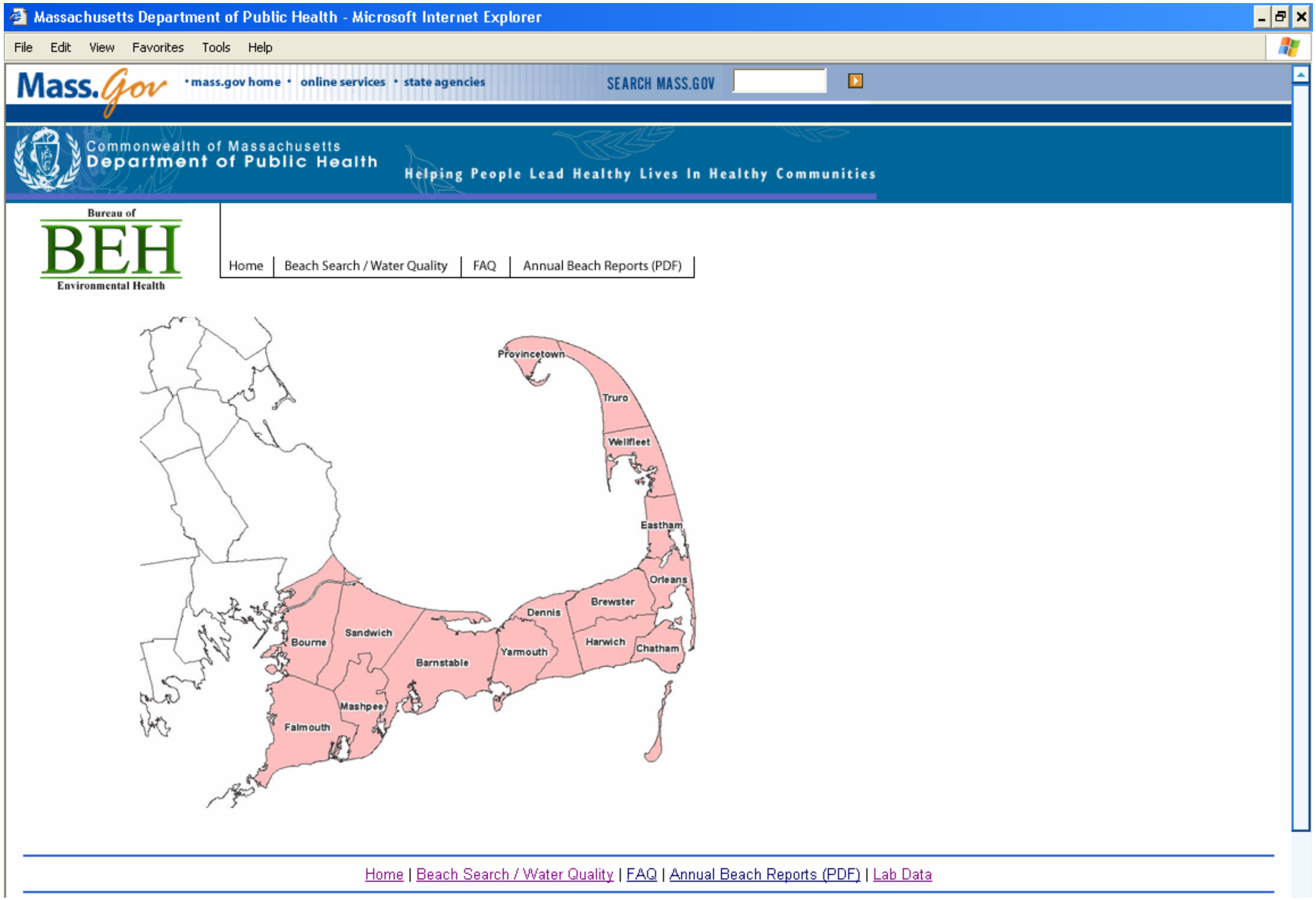


Figure 3: MDPH Public Beach Notification Website: Chatham Beach Posting Data

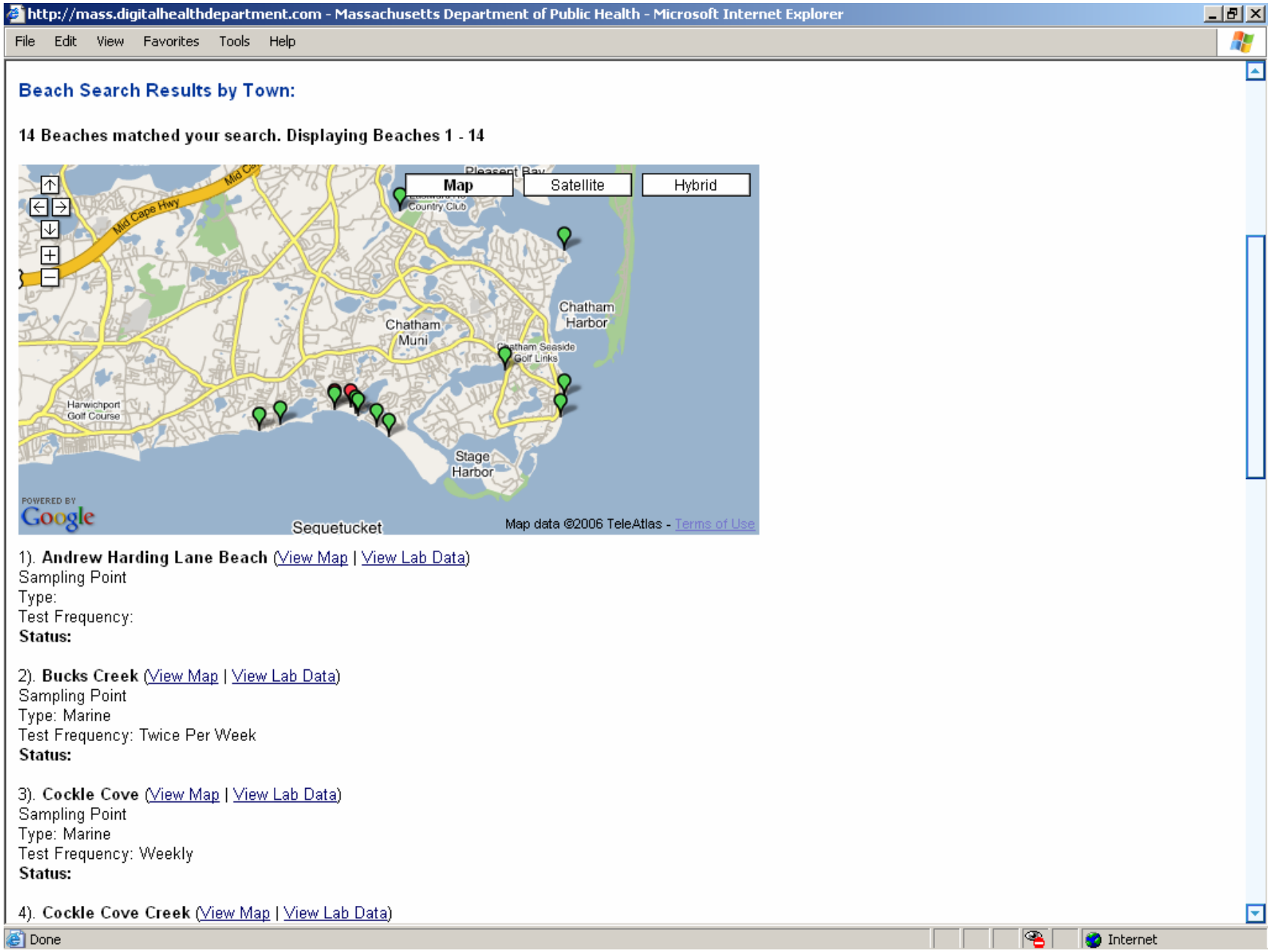


Figure 4:
All Massachusetts communities grouped by type of public/semi-public bathing beach for 2007

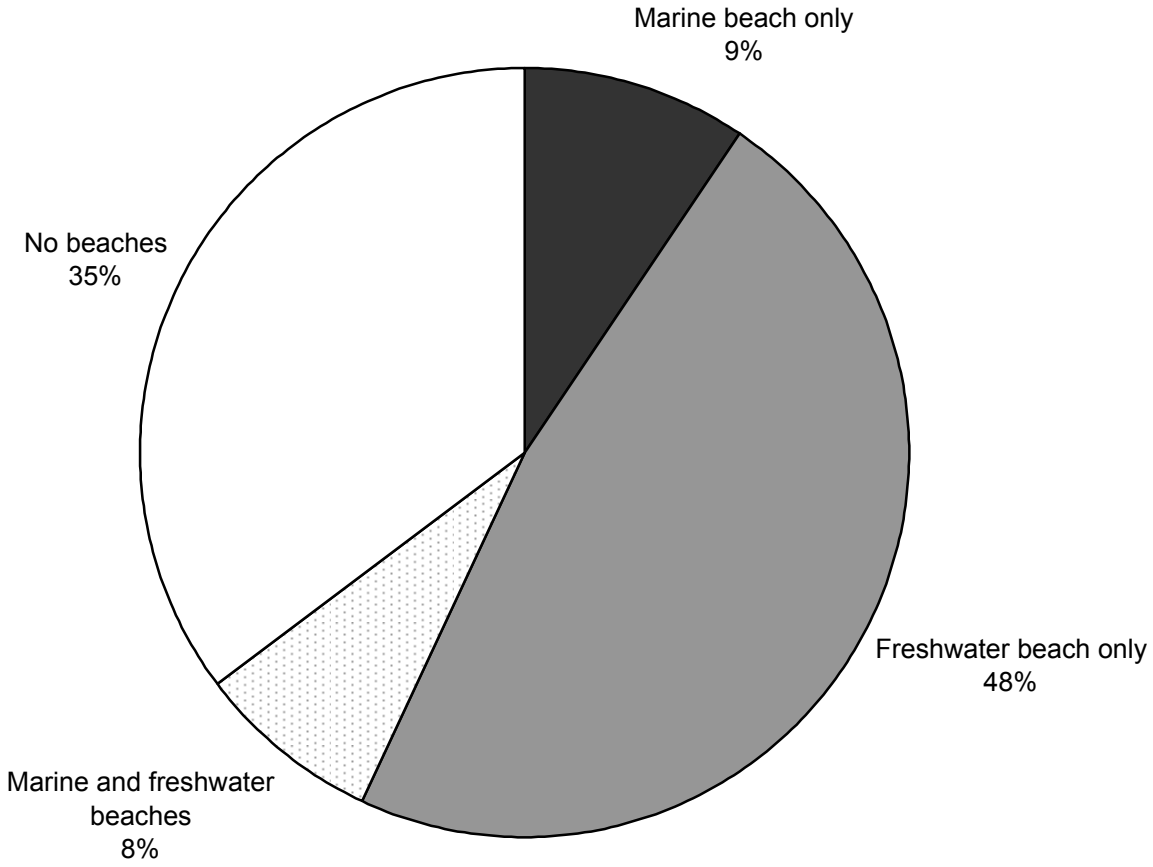


Figure 5:
Coastal communities in Massachusetts grouped by presence or absence of public/semi-public marine beaches and testing data for 2007

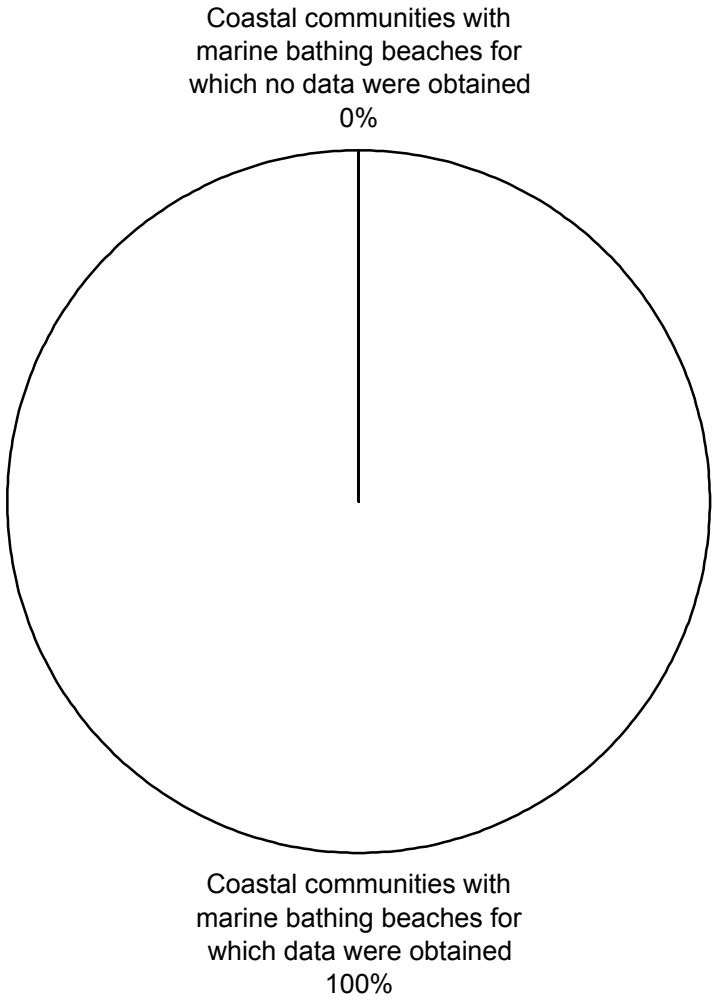


Figure 6:
Bather density at public/semi-public marine bathing beaches at times of water sampling for 2007

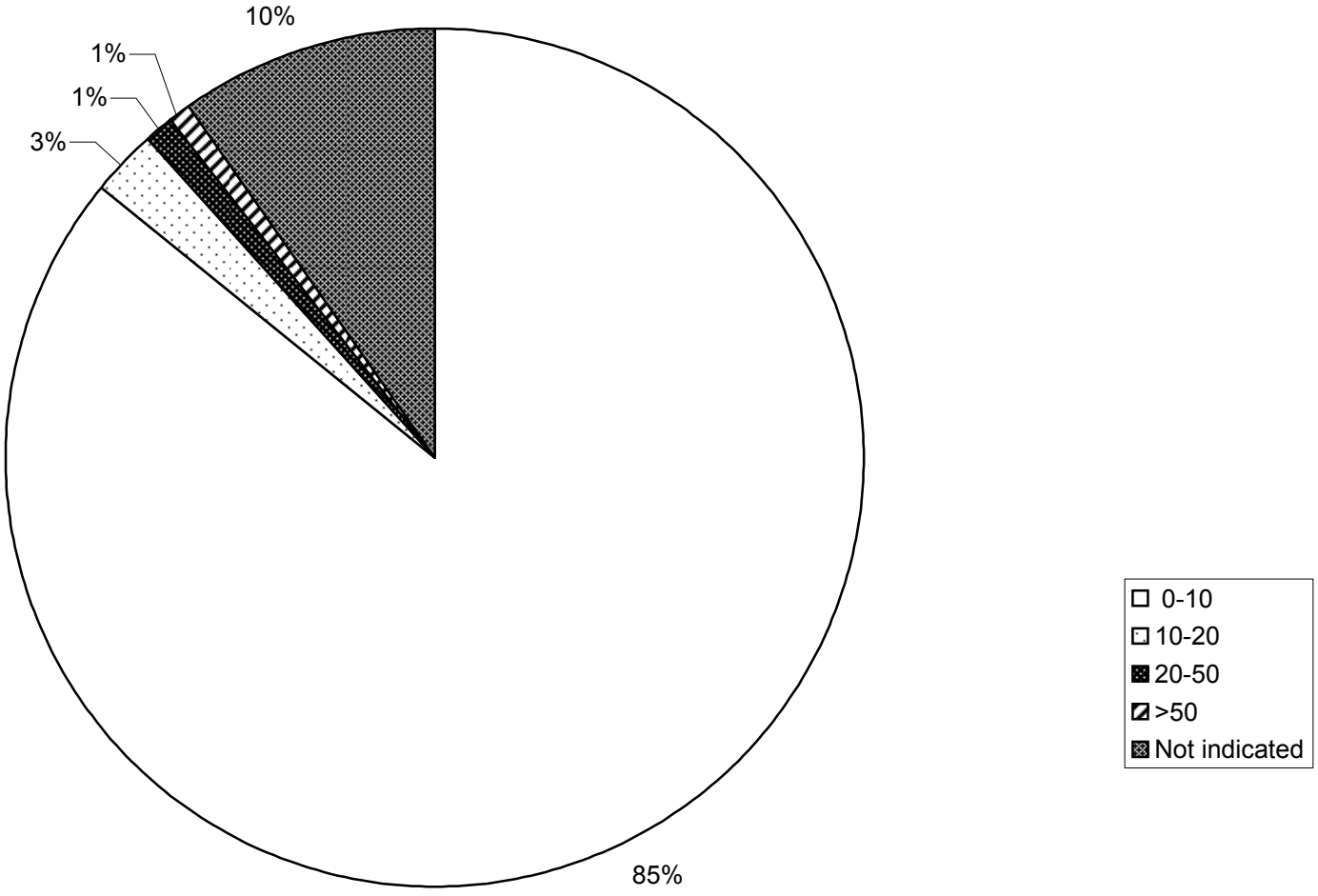


Figure 7:
Water quality indicators used to test public and semi-public marine bathing beaches in Massachusetts for 2007

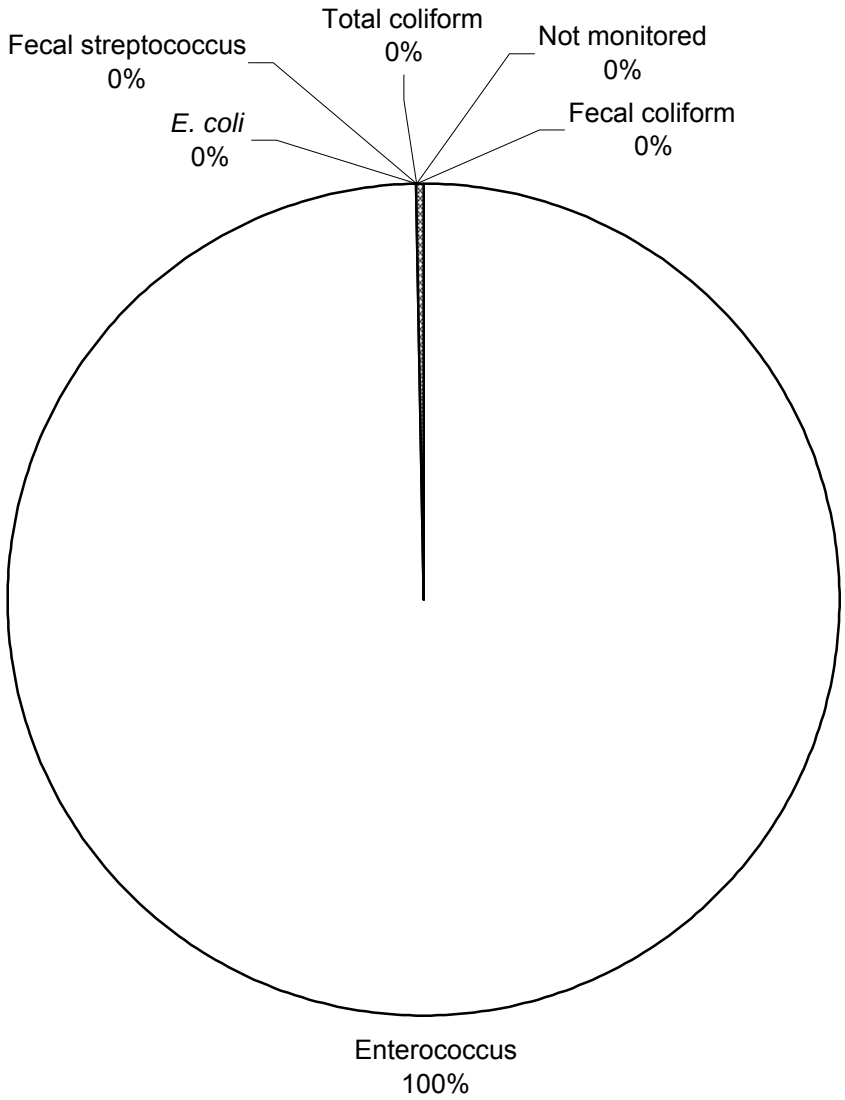


Figure 8:
Frequency of water quality testing at public/semi-public marine bathing beaches in Massachusetts for 2007

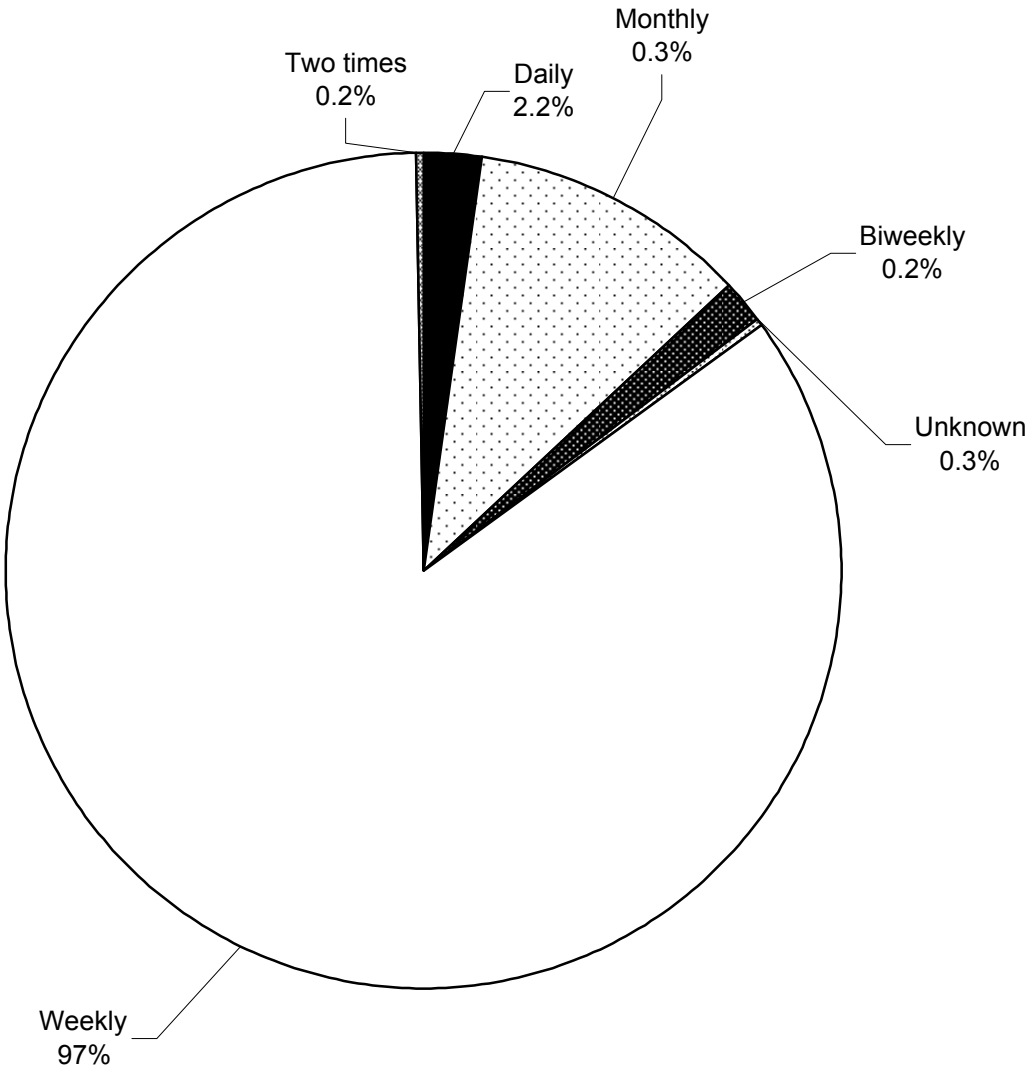


Figure 9:
Communities in Massachusetts grouped by presence or absence of public/semi-public freshwater bathing beaches and testing data for 2007

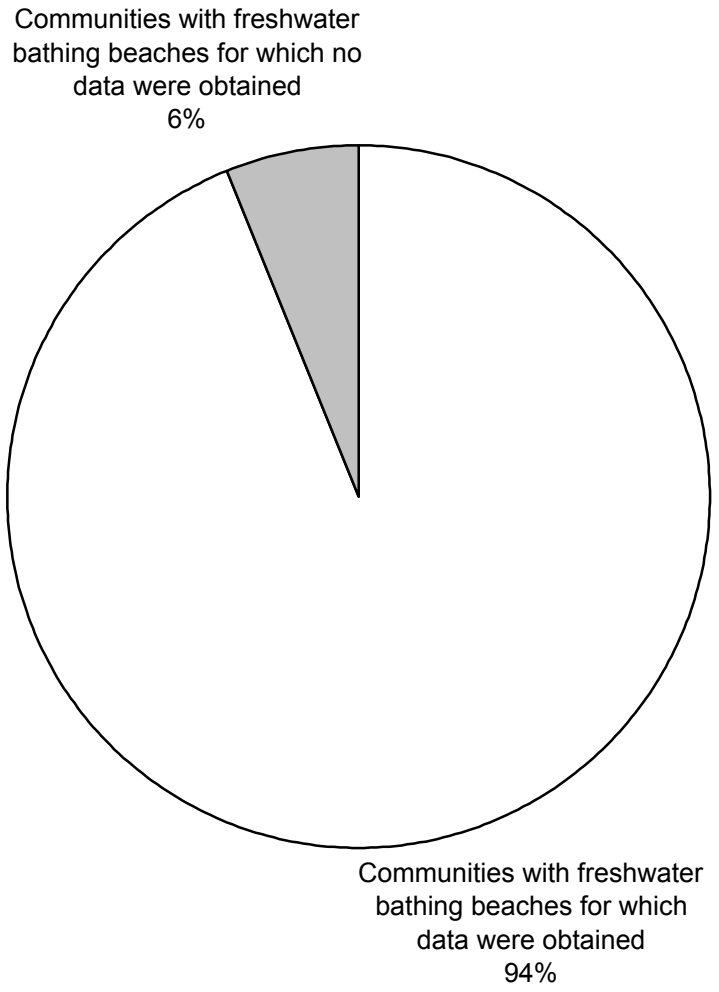


Figure 10:
Bather density at public/semi-public freshwater beaches at times of water sampling for 2007

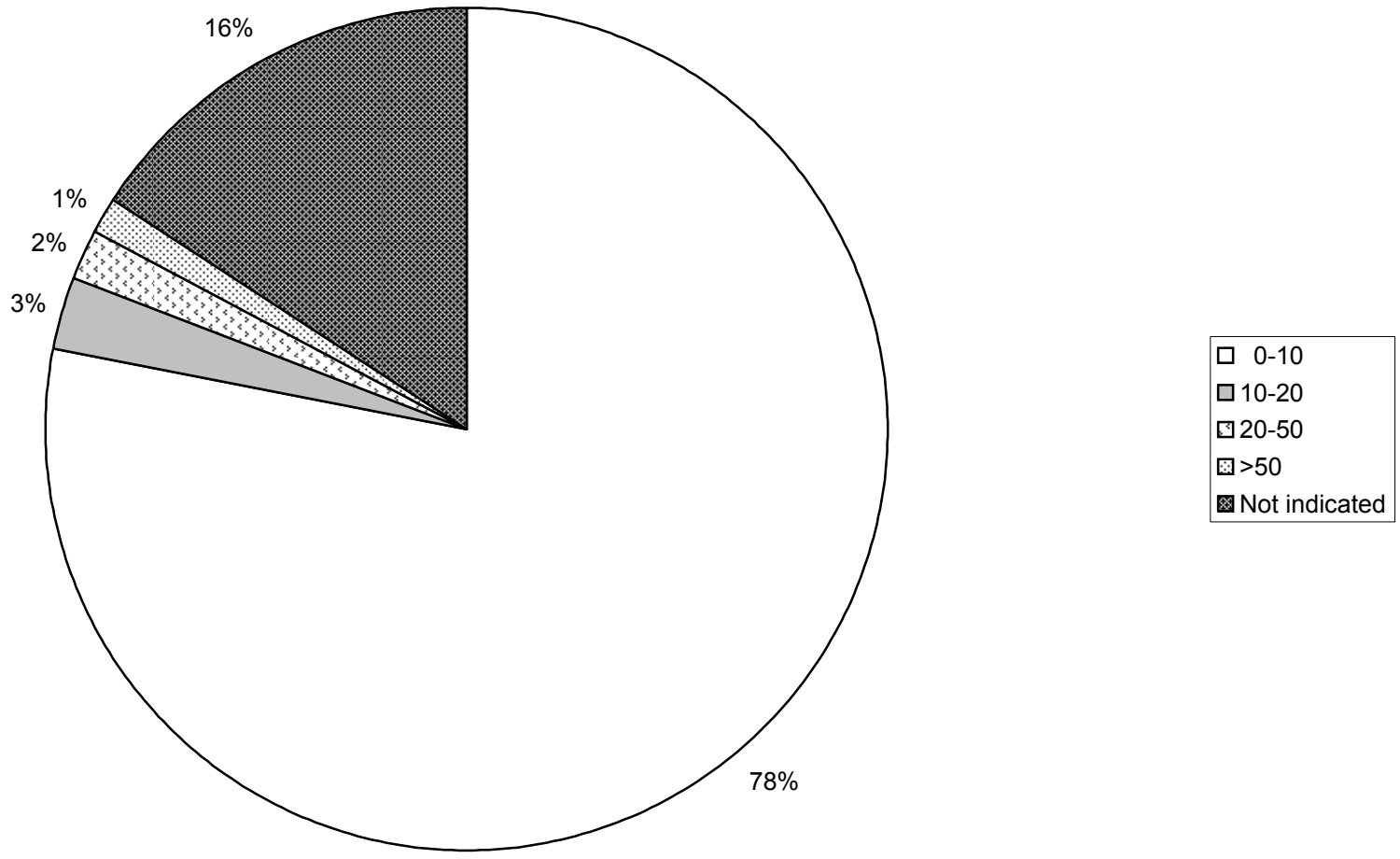


Figure 11:
Water quality indicators used to test public and semi-public freshwater beaches in Massachusetts for 2007

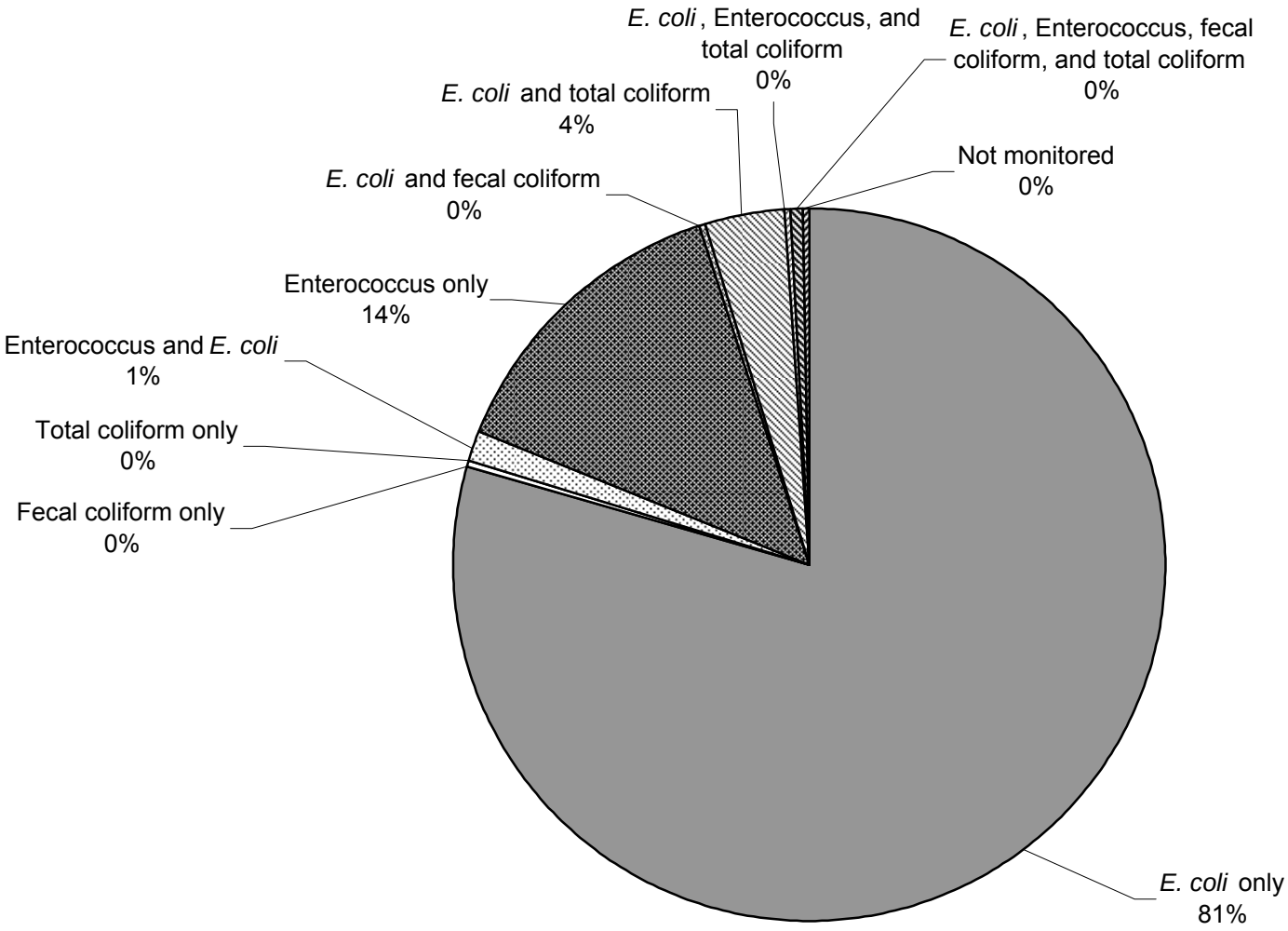


Figure 12:
Frequency of water quality testing at public/semi-public freshwater beaches in Massachusetts for 2007

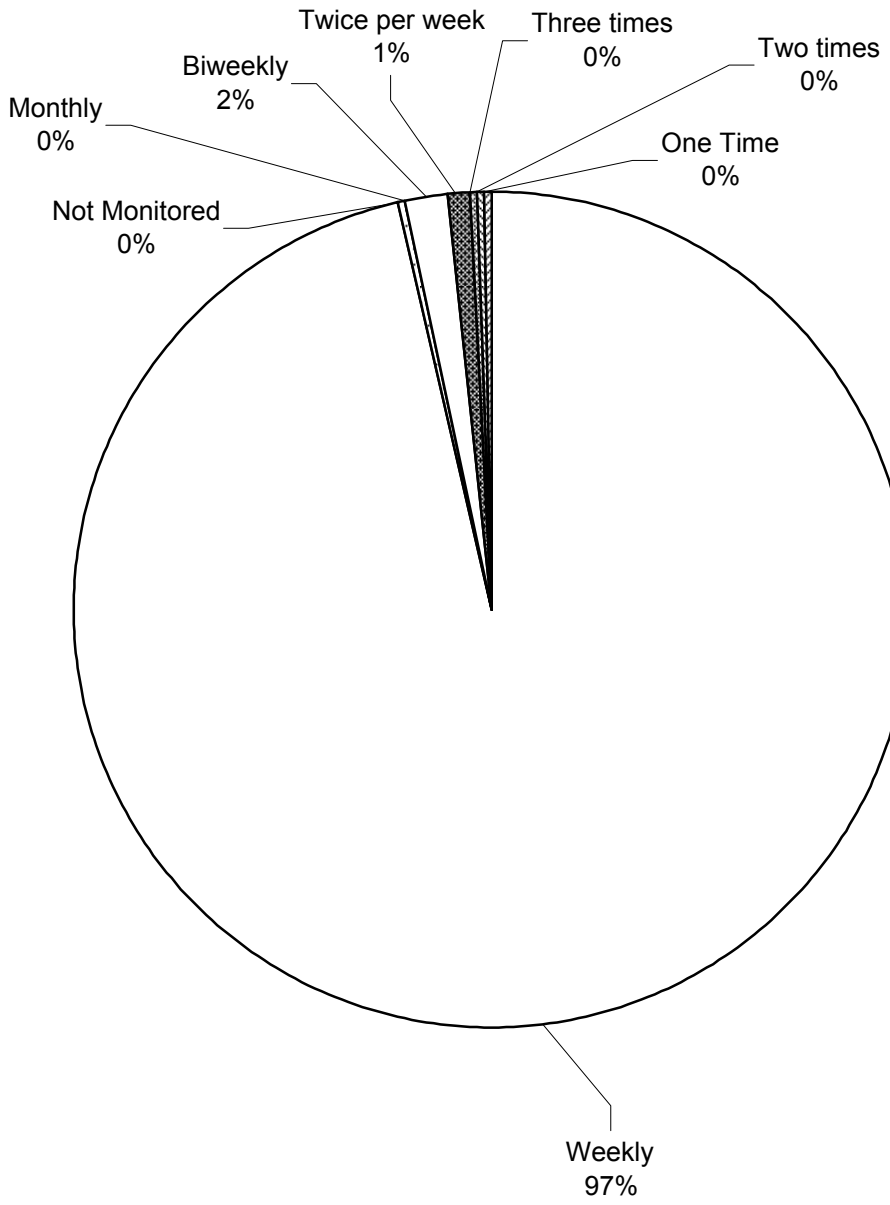


Figure 13. Marine Beach Communities That Reported Data in 2007

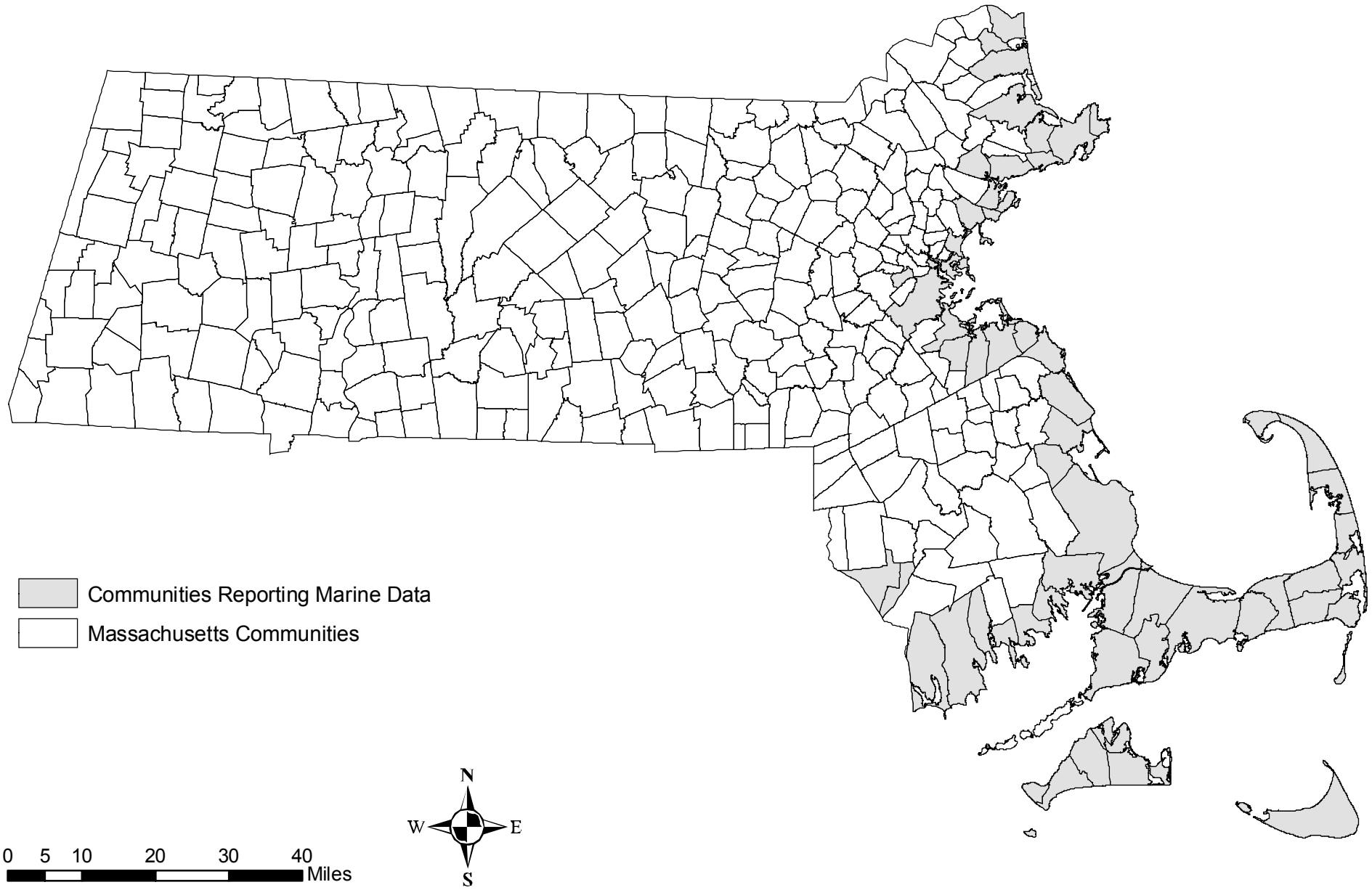


Figure 14. Freshwater Beach Communities That Reported Data in 2007

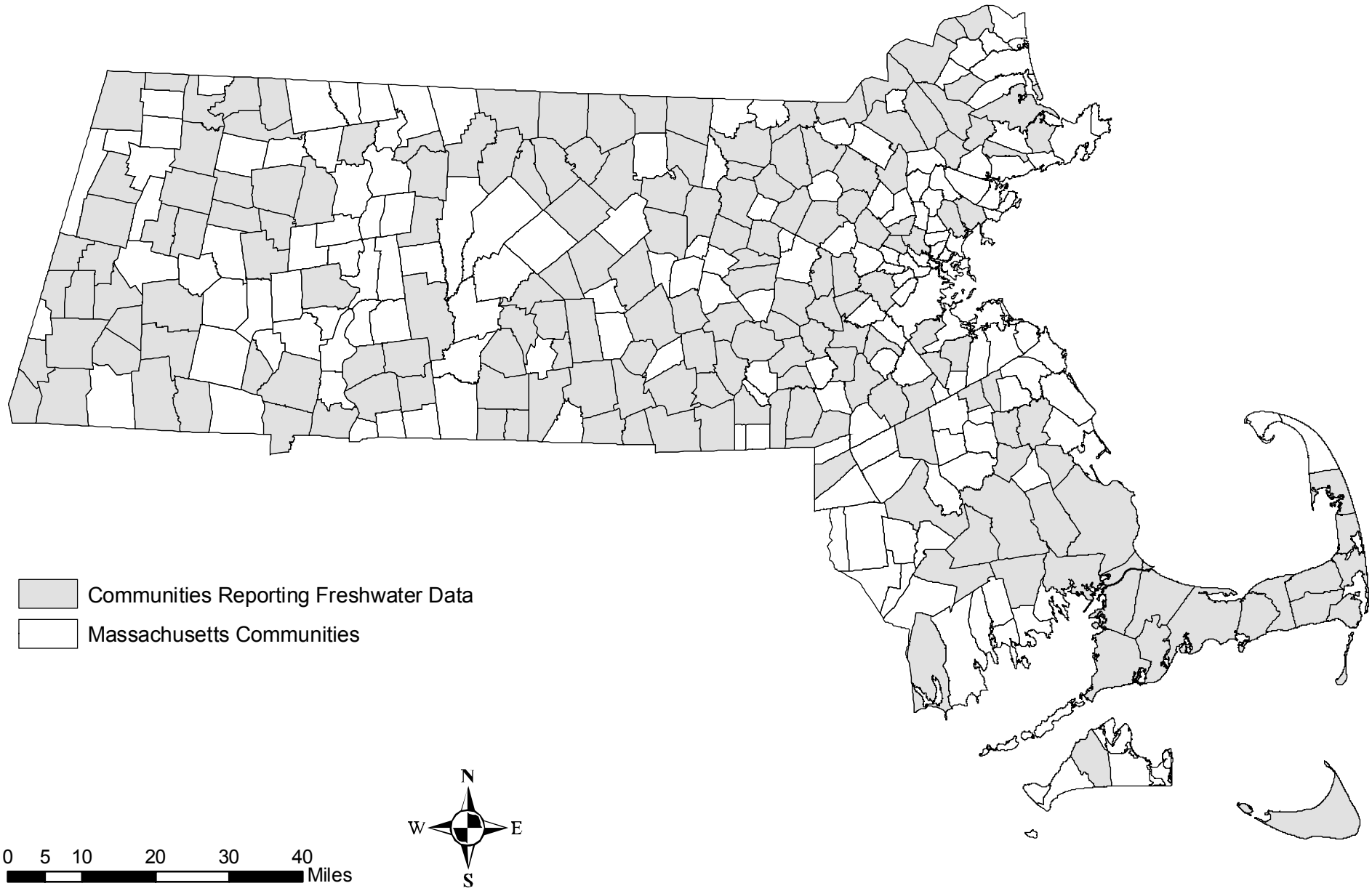


Figure 15
Number of Beach Water Samples Reported to MDPH

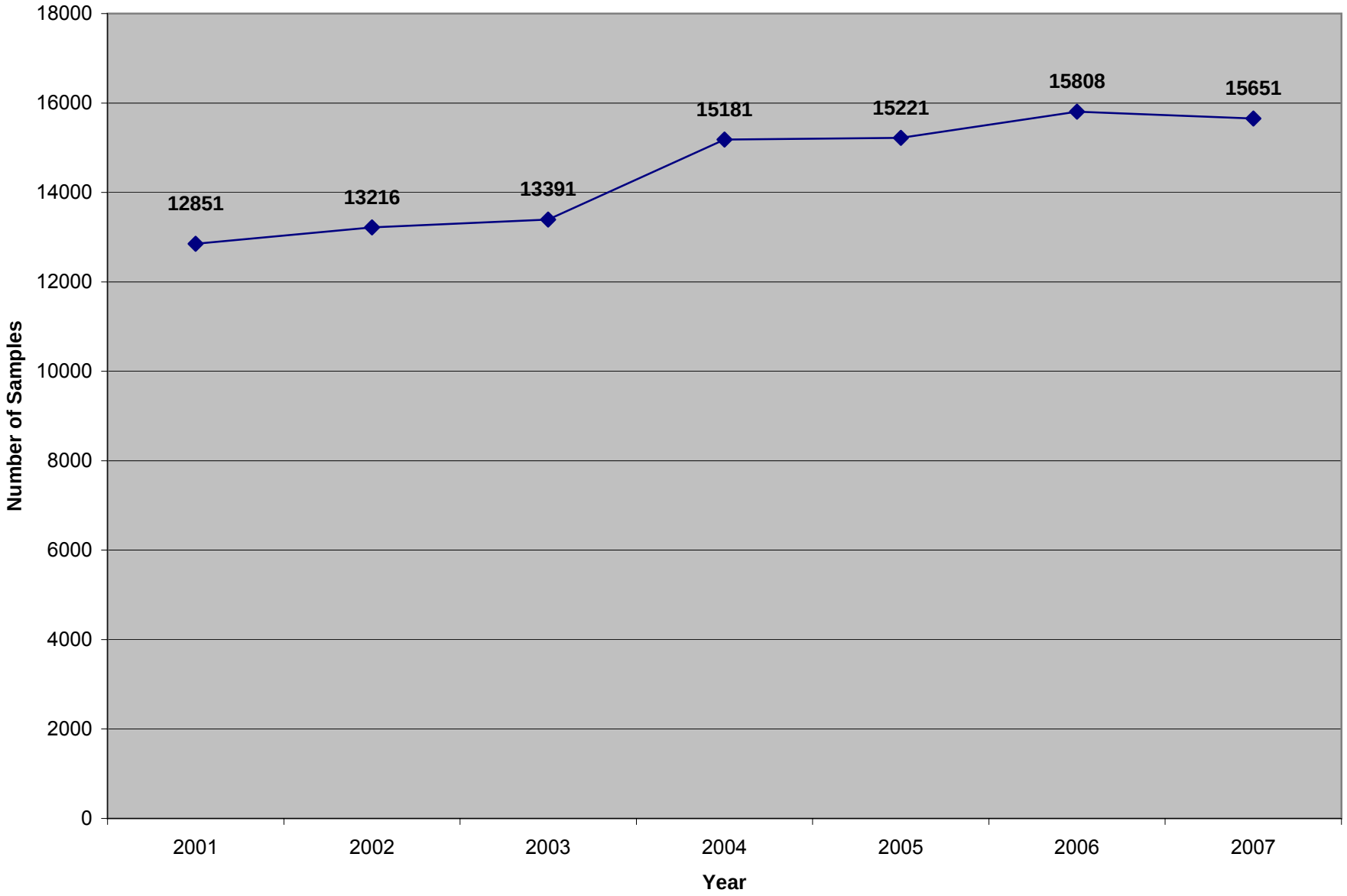


Figure 16
Massachusetts Bathing Beaches that Reported Data to MDPH

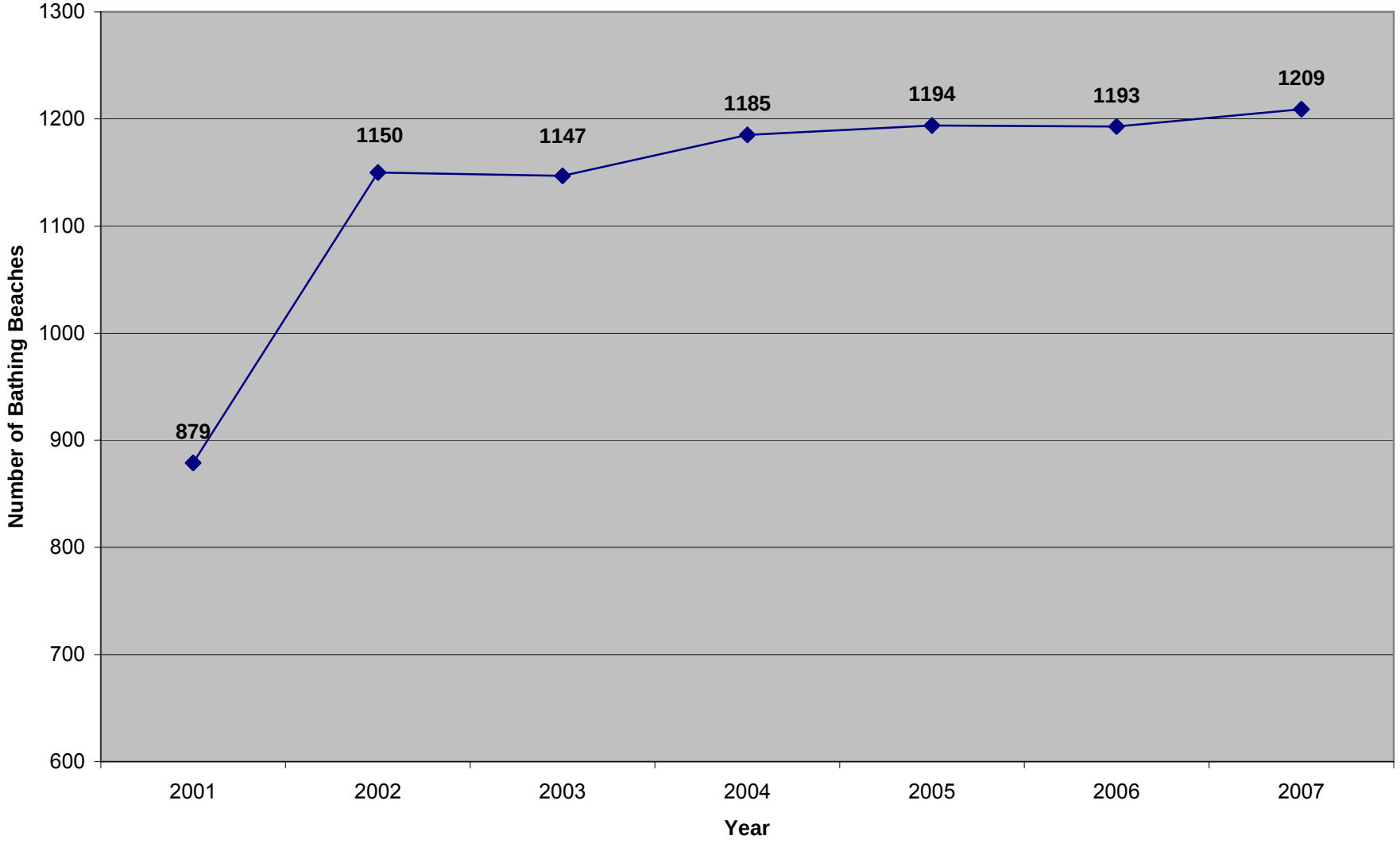


Figure 17
Massachusetts Communities Reporting Beach Data

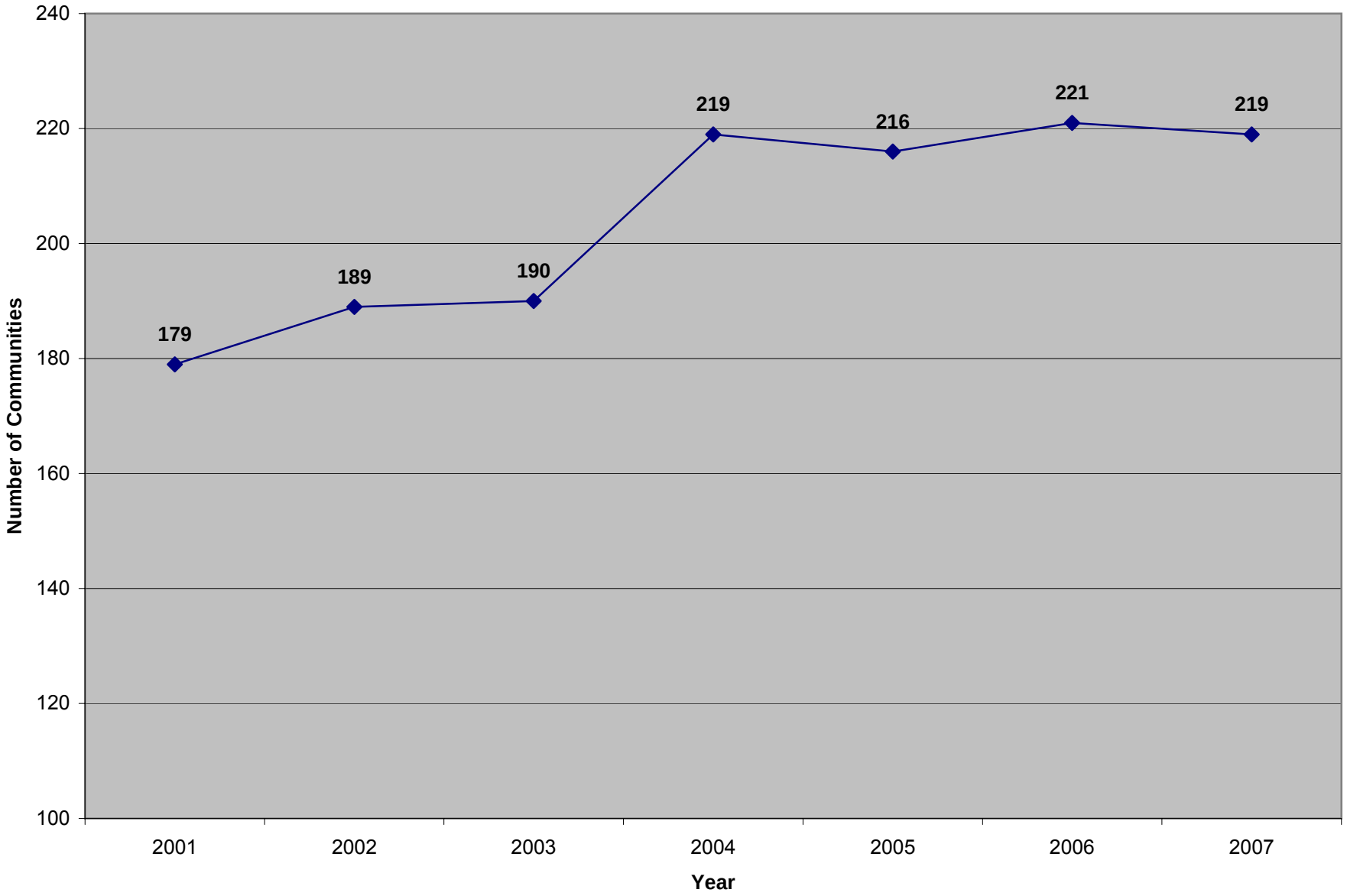


Figure 18:
Water quality samples at public/semi-public marine bathing beaches in Massachusetts for 2007

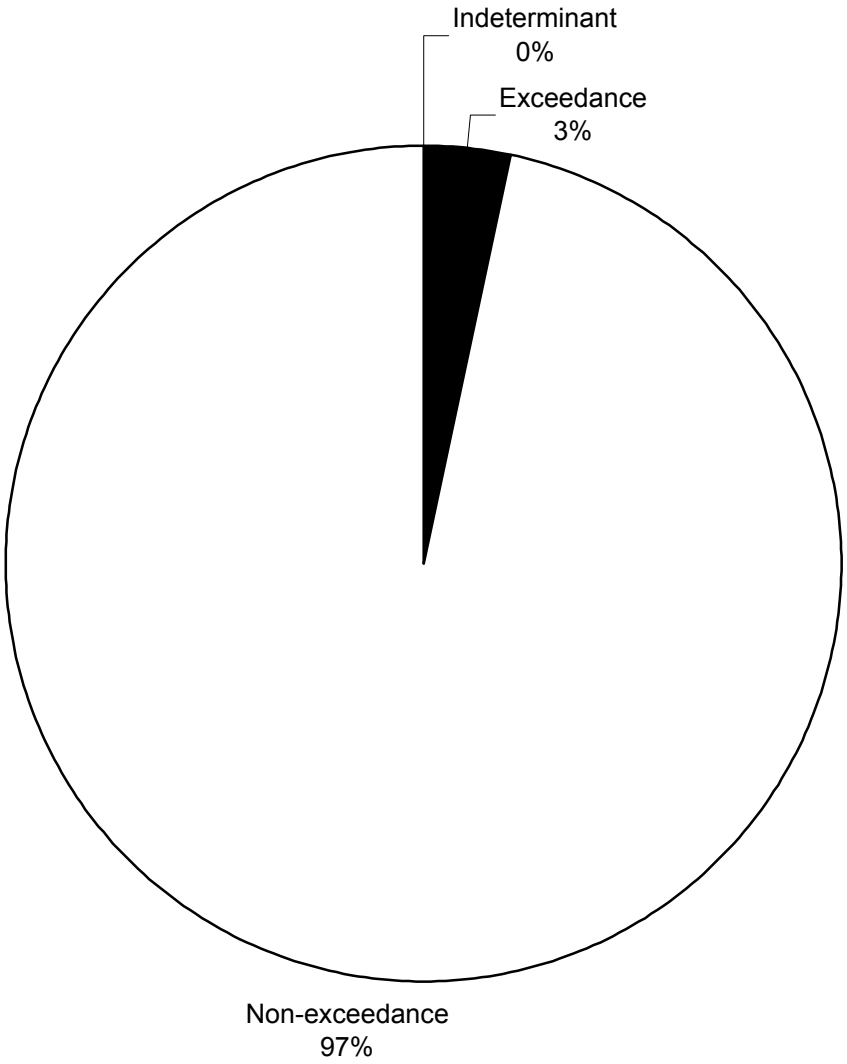


Figure 19. Marine Beach Communities with At Least One Water Sample Exceeding Criteria in 2007

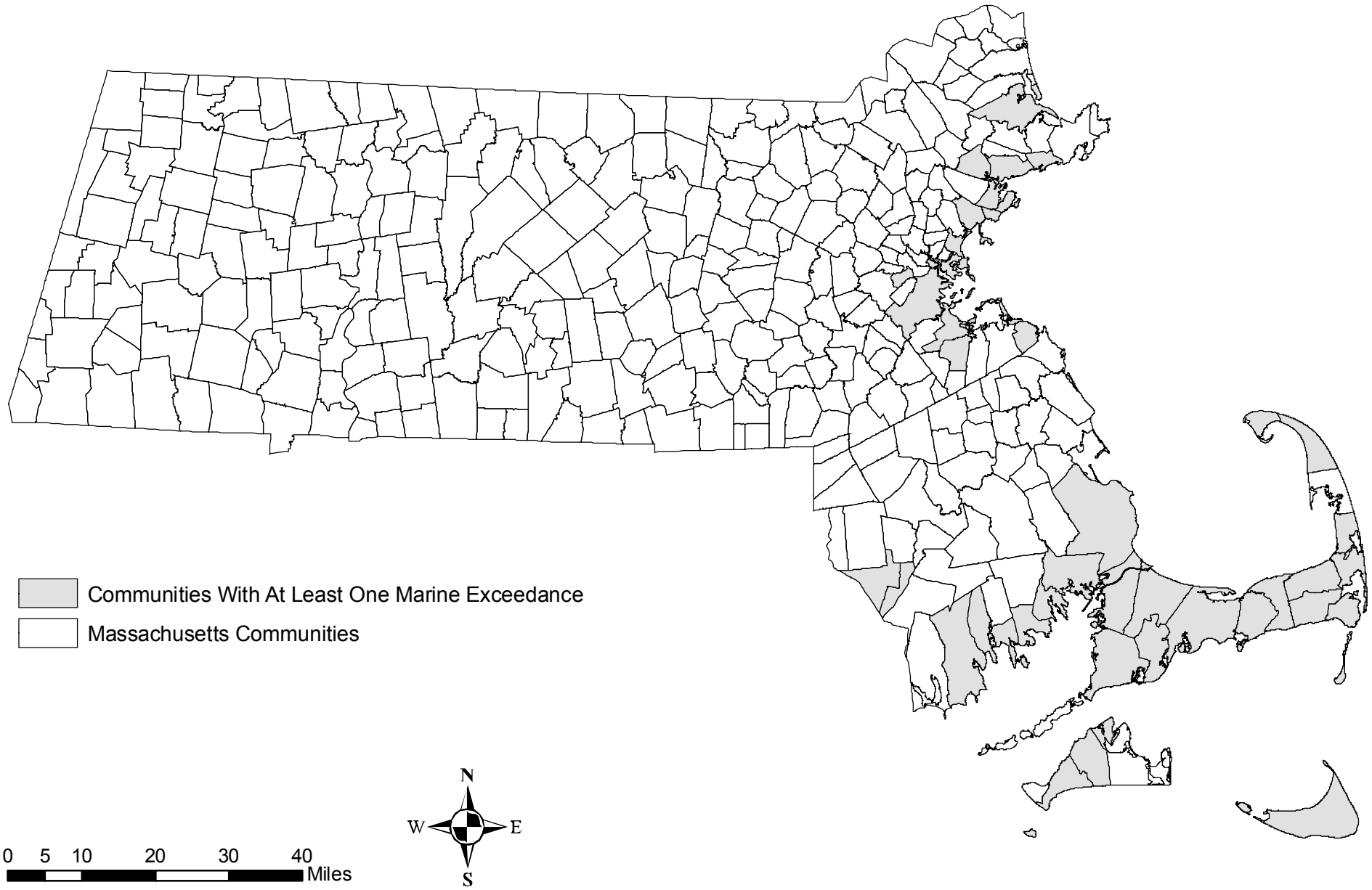


Figure 20:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2007

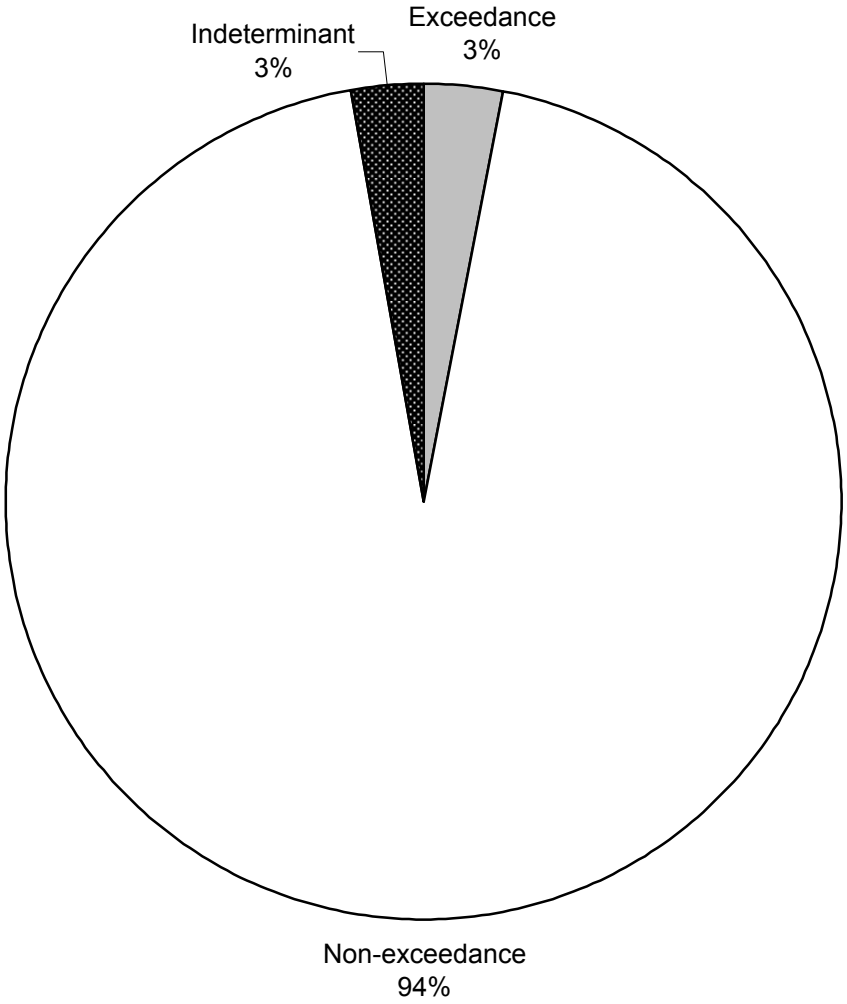


Figure 21. Freshwater Beach Communities With At Least One Water Sample Exceeding Criteria in 2007

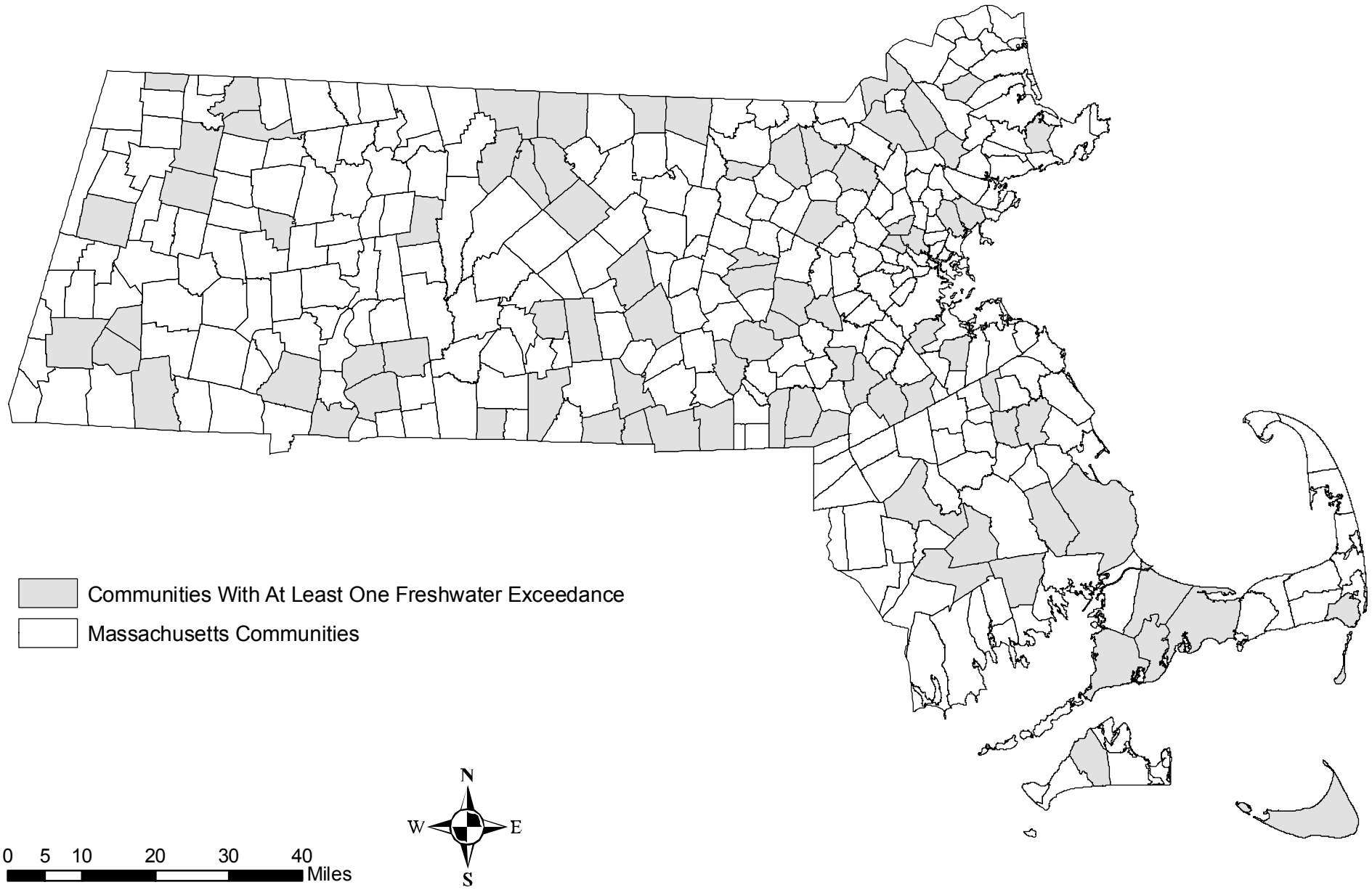
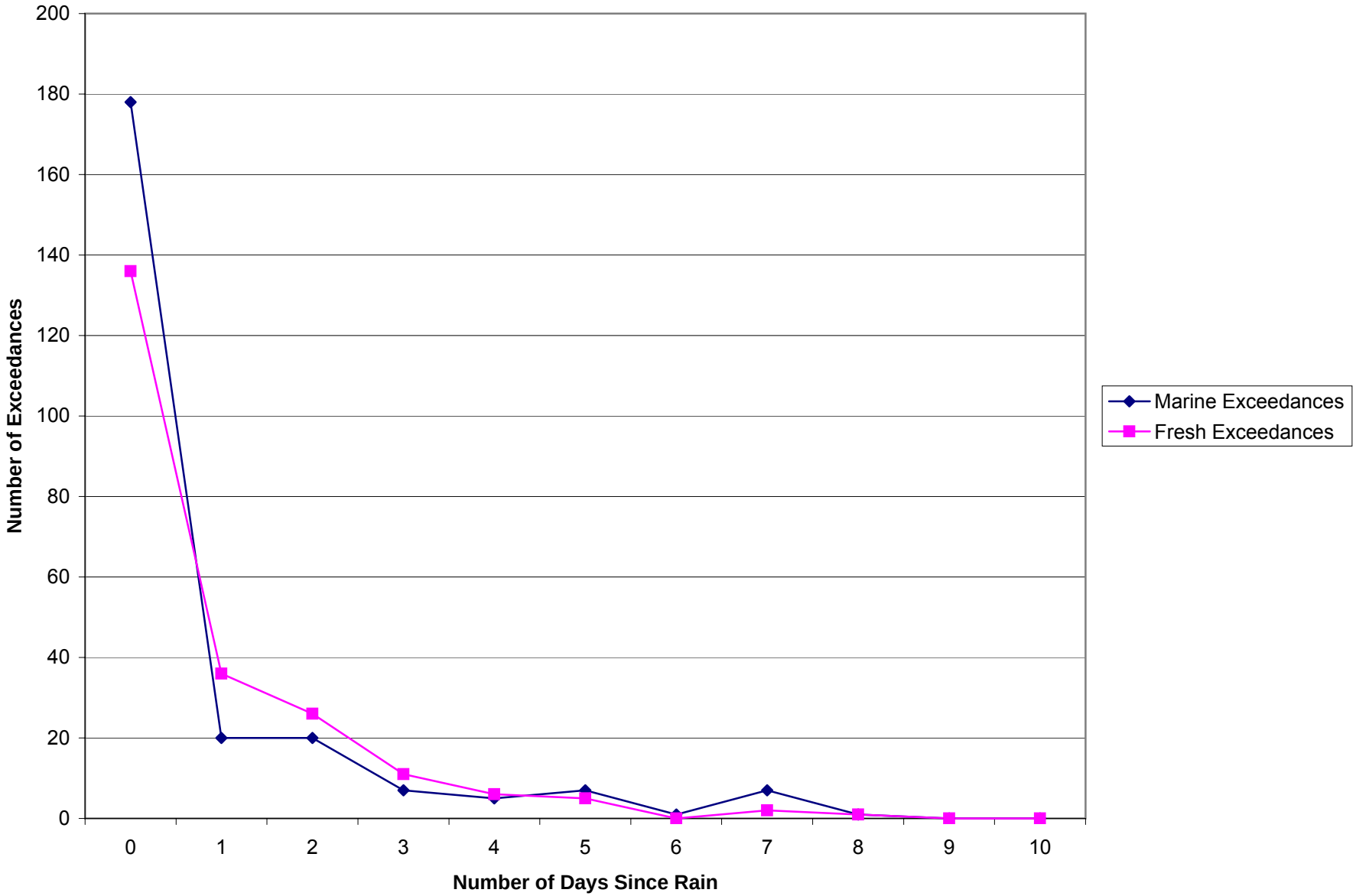


Figure 22

Exceedances Reported Based on the Number of Days Since Last Rainfall at Massachusetts Public and Semi-Public Bathing Beaches During the 2007 Season



XI. APPENDICES

- **A. MASSACHUSETTS STATE REGULATIONS**
- **B. GENERAL LAWS OF MASSACHUSETTS**
- **C. MASSACHUSETTS' BEACH ACT**
- **D. FEDERAL BEACH ACT**
- **E. MDPH BEACH SAMPLING FIELD DATA FORM**

APPENDIX A

MASSACHUSETTS STATE REGULATIONS

105 CMR 445.000

MINIMUM STANDARDS FOR BATHING BEACHES
STATE SANITARY CODE, CHAPTER VII

445.001: Purpose

The purpose of 105 CMR 445.000 is to protect the health, safety and well-being of the users of bathing beaches, to establish acceptable standards for the operation of bathing water and to establish a procedure for informing the public of any bathing water closures.

445.002: Authority

105 CMR 445.000 is adopted under the authority of M.G.L. c. 111, ss. 3, 5S and 127A.

445.003: Citation

105 CMR 445.000 shall be known and may be cited as 105 CMR 445.000: *Minimum Standards for Bathing Beaches* (State Sanitary Code, Chapter VII).

445.004: Scope

105 CMR 445.000 shall apply to all public and semi-public bathing beaches.

445.010: Definitions

The words, terms or phrases listed below, for the purpose of 105 CMR 445.000, shall be defined and interpreted as follows:

Bathing Beach means the land where access to the bathing water is provided. It shall not mean a swimming pool as defined in 105 CMR 435.000: Minimum Standards for Swimming Pools (State Sanitary Code, Chapter V).

Bathing Water means fresh or salt water adjacent to any public bathing beach or semipublic bathing beach at the location where it is used for bathing and swimming purposes.

Board of Health means the appropriate and legally designated health authority of the city, town, or other legally constituted governmental unit within the Commonwealth having the usual powers and duties of the board of health of a city or town, or its authorized agent or representative.

Department means the Department of Public Health.

Operator means any person who

(1) alone or jointly or severally with others has legal title to a bathing beach, whether or not that person has legal title or control of the bathing water; or
(2) has care, charge or control of such bathing beach as agent or lessee of the owner or an independent contractor.

Person means any individual or any partnership, corporation, firm, association or group, or the Commonwealth, or any of its agencies, authorities or departments or any political subdivisions of the Commonwealth, including municipalities or other legal entity.

Public Bathing Beach means any bathing beach open to the general public, whether or not any entry fee is charged, that permits access to bathing waters.

Semi-Public Bathing Beach means any bathing beach used in connection with a hotel, motel, a manufactured home park, campground, apartment house, condominium, country club, youth club, school, camp or other similar establishment where the primary purpose of the establishment is not the operation of the bathing beach, and where admission to the use of the bathing beach is included in the fee consideration paid or given for the primary use of the premises. Semi-Public Bathing Beach also means a bathing beach operated solely for the use of members and guests of an organization that maintains such a bathing beach.

Private Bathing Beach means any bathing beach not considered to be a public or semipublic bathing beach.

Sanitary Survey means a written report, conducted by a Massachusetts Registered Sanitary Engineer, Certified Health Officer or Registered Sanitarian, documenting an examination of the bathing water and contiguous land masses for the purpose of identifying actual or potential sources of microbiological or chemical contamination. The sanitary survey shall also include a description of the water circulation associated with the bathing area, the impact of bather load on the bathing beach area and any natural or artificial physical hazards.

445.020: Operation

No operator shall allow bathing or swimming in bathing water whenever in the opinion of the Board of Health or the Department the bathing water is or may be hazardous or unsafe for bathing or swimming. Bathing and swimming at public and semi-public beaches shall be limited to water areas that meet the requirements of 105 CMR 445.030. Any operator of a public or semi-public bathing beach shall comply with the requirements of 105 CMR 445.000.

445.030: Bathing Water Quality

Bathing or swimming shall not be permitted in any bathing water where the quality of the water does not meet the standards established in 105 CMR 445.030(A), 445.030(B), or 445.030(C), and no bathing or swimming shall be allowed when the bathing water is determined by the Board of Health or the Department to be unfit or so subject to contamination as to constitute a menace to health. Bathing or swimming shall not be permitted in bathing waters when:

(A) Physical Quality.
(1) Sludge deposits, solid refuse, floating waste solids, oils, grease or scum are present; or
(2) There are safety hazards including, but not limited to, fast currents, sharp drop-offs or an unstable bottom in the wading area(s) or lack of water clarity.

(B) Bacteriological Quality.
(1) The results of a sanitary survey or other information indicates that sewage or other hazardous substances may be discharged into the bathing water to a degree considered by the Board of Health or the Department to be of public health significance; or

(2) Epidemiological evidence discloses the prevalence of an infectious disease or other health condition which is considered to be related to the use of the bathing water and is considered by the Board of Health or the Department to be of public health significance; or

(3) The bacteriological quality of the bathing water is unacceptable as determined by laboratory analysis for the appropriate indicator organisms specified in 105 CMR 445.031 and exceeds the standards established therein.

(C) Oil, Hazardous Materials, or Heavy Metals. Oil, hazardous materials, or heavy metals are present in excess of surface water quality standards or guidelines established by the United States Environmental Protection Agency or the Massachusetts Department of Environmental Protection.

445.031: Indicator Organisms

(A) For marine water, the indicator organism shall be Enterococci. No single Enterococci sample shall exceed 104 colonies per 100 ml. and the geometric mean of the most recent five (5) Enterococci levels within the same bathing season shall not exceed 35 colonies per 100 ml.

(B) For fresh water, the indicator organisms shall be E. Coli or Enterococci.

(1) No single E. Coli sample shall exceed 235 colonies per 100 ml. and the geometric mean of the most recent five E. Coli samples within the same bathing season shall not exceed 126 colonies per 100 ml; or

(2) No single Enterococci sample shall exceed 61 colonies per 100 ml. and the geometric mean of the most recent five (5) Enterococci samples within the same bathing season shall not exceed 33 colonies per 100 ml.

445.032: Collection of Bathing Water Samples

(A) Location. The Board of Health, for public and semi-public bathing beaches that are not operated by the Commonwealth, and the Department, for bathing beaches that are operated by the Commonwealth, shall approve sampling locations at each bathing beach in its jurisdiction. Samples of bathing water shall be taken at locations within areas of greatest bather load. Additional samples shall also be obtained at any critical location subject to contamination from business developments, dwellings, streams, sewer outfall pipes or other sources. All required samples shall be obtained from these designated locations.

(B) Sample Collection. Samples shall be obtained in accordance with the procedures recommended by the most recent edition of the Standard Methods for the Examination of Water and Waste Water of the American Public Health Association or as approved by the United States Environmental Protection Agency.

(C) Frequency.

(1) The Board of Health, its agent, or any other authorized person shall collect the bacteriological samples:

(a) Within five days of the opening of the bathing season; and

(b) At least weekly during the bathing season at a time and day approved by the Board of Health or the Department; and

(c) Prior to reopening a beach after closing for any reason.

(2) Testing for oil, hazardous materials, or heavy metals shall only be required if the operator, the Board of Health, or the Department has information indicating possible contamination of the bathing beach or bathing waters from oil, hazardous materials or heavy metals.

(D) Field Data. Physical conditions noted at the time of sampling shall be recorded on a form provided by the Department

(E) Personnel. Samples shall be taken by the Board of Health, the Department, their duly authorized representatives or other qualified persons as determined by the Board of Health or the Department.

445.033: Laboratory Analysis and Reporting

(A) Laboratory Analysis. Laboratory analysis of bathing water as required by 105 CMR 445.000 shall be conducted in accordance with the most recent edition of the Standard Methods for Examination of Water and Waste Water of the American Public Health Association or as approved by the United States Environmental Protection Agency.

(B) Reporting.

(1) Routine Reporting by Operators. Any operator or authorized agent of a public bathing beach, except public bathing beaches operated by the Commonwealth, and any operator or authorized agent of a semi-public bathing beach shall report the certified results of all testing, monitoring and analysis of bathing water to the Board of Health within five (5) days of receipt of the results from the laboratory.

(2) Reporting by Operators of Levels Exceeding the Established Standards. Any operator or authorized agent of a public or semi-public bathing beach shall immediately report to the Board of Health the results of all testing, monitoring and analysis of bathing water found to exceed the standards established in 105 CMR 445.030.

(3) Reporting by the Board of Health. The Board of Health or its authorized agent shall report the results of all testing, monitoring and analysis of bathing water to the Department no later than October 31 of each year.

445.034: Bathing Beaches Operated by the Commonwealth

State agencies that own or operate a bathing beach shall conduct or cause to be conducted all testing, monitoring, and analysis of bathing water at such bathing beach in accordance with these regulations. If the results of such testing, monitoring and analysis are found to exceed the standards established in 105 CMR 445.030, state agencies shall immediately, and in no event later than 24 hours, report the results of such testing, monitoring and analysis to the Department and the Board of Health in the city or town where the bathing beach is located. All other results shall be reported to the Department no later than October 31 of each year.

445.035: Sampling and Analysis at Semi-Public Beaches

(A) The operators of semi-public bathing beaches shall pay for the costs of testing, monitoring and analysis of bathing waters adjacent to such semi-public bathing beaches.

(B) Operators of semi-public bathing beaches may enter into contractual agreements with the Board of Health to have the testing, monitoring and analysis of bathing water conducted by the Board of Health, the Department or other qualified persons as determined by the Board of Health or the Department.

445.036: Public Request for Testing

Any person may request that the Board of Health, or in the case of a bathing beach operated by the Commonwealth, the state agency or the Department, conduct testing, monitoring, and analysis of public and semi-public bathing waters when there is reasonable basis to believe that an alleged violation of 105 CMR 445.000 has occurred. The Board of Health or the Department, as appropriate, shall promptly review such requests and determine whether any such testing, monitoring, and analysis is necessary to ensure the public health and safety of bathing waters.

445.040: Posting and Reopening Notifications

(A) Posting. Whenever the bathing water quality does not meet the requirements of 105 CMR 445.030 or after any significant rainstorm at a bathing beach where there has been a history of violations of the water quality requirements contained in 105 CMR 445.030, the Board of Health, its agent, or any other authorized person shall immediately, and in no event later than 24 hours, notify the Department, and post or cause to be posted, a sign, or signs, at the entrance to each parking lot and each entrance to the beach stating:

WARNING! NO SWIMMING
SWIMMING MAY CAUSE ILLNESS

and a graphic depiction of a swimmer in a red circle with a diagonal hatch mark. The sign shall also contain the reason for the warning, the date of the posting and the name and telephone number of the board of health.

(B) Reopening. Prior to reopening bathing water posted due to a violation of the standards established in 105 CMR 445.030, the Board of Health, its agent, or any other authorized person shall verify that the certified results of the laboratory analysis are less than the standard specified in 105 CMR 445.031. The operator of any state operated bathing beach shall notify the Department and the Board of Health within 24 hours, or the next business day, of the reopening of the bathing water.

445.100: Variance

(A) The Board of Health may grant a variance from the provisions of 105 CMR 445.000 for any public or semi-public bathing beach not operated by the Commonwealth. The Department may grant a variance for any bathing beach operated by the Commonwealth. In granting a variance, the Board of Health and the Department shall review available epidemiological data and a written sanitary survey of the bathing beach, as provided by the operator. The survey shall include:
(1) All possible sources of contamination, both bacterial and chemical, on the watershed tributary to the bathing beach including the location and volume of:
(a) sewage and industrial waste water discharges;
(b) storm water overflows;
(c) bird and animal populations; and
(d) commercial and agricultural drainage.
(2) The volume and quality of the diluting water, water depth, water surface area, tides and confluence of tributaries, water currents and prevailing winds.

(B) Any variance granted by the Board of Health shall specify the required

continued bacteriological testing schedule, provided that the frequency of bacteriological testing shall not be less than once prior to the bathing season and at least every 30 days thereafter throughout the duration of the bathing season.

(C) Any variance granted by a Board of Health or the Department shall expire*:*
(1) at any time as determined by the Board of Health, but in no instance greater than four years, at which time the operator may apply for an extension, or
(2) at any time the results of bacterial test exceed the levels at 105 CMR 445.031.

(D) No variance from the requirement of weekly testing shall be granted until the applicant provides the Board of Health or the Department with water quality data collected for at least two complete and consecutive bathing seasons.

(E) In granting a variance, the Board of Health or the Department must determine that the enforcement of 105 CMR 445.000 would not serve a significant public health purpose and that the granting of the variance will not conflict with the intent and spirit of these minimum standards. Any variance or other modification authorized to be made by these regulations may be subject to such qualification, revocation, suspension, or other expiration as the Board of Health or the Department expresses in its grant. A variance or other modification authorized to be made by this regulation may otherwise be revoked, modified, or suspended in whole or in part, only after the holder thereof has been notified in writing and has been given the opportunity to be heard.

445.101: Variance to be in Writing

(A)Any variance granted by the Board of Health or the Department shall be in writing. Any denial for a variance shall also be in writing and shall contain a brief statement of the reasons for denial. A copy of each variance shall be conspicuously posted for 30 days following its issuance and shall, while it is in effect, be available to the public at all reasonable hours in the office of the clerk of the city or town, or in the office of the Board of Health and in the case of a variance by the Department, at the Department.

(B) The Board of Health shall submit to the Department a notice of the intent to grant a variance. The Department shall approve, disapprove, or modify the variance within 45 days from receipt thereof. If the Department fails to comment within 45 days, its approval shall be presumed. No alteration of any requirement in these regulations shall be made under any variance until the Department approves it or 45 days has elapsed without comment, unless the Board of Health certifies in writing to the Department that an emergency exists.

445.300: Severability

In the event that any section of 105 CMR 445.000 is found to be invalid or unconstitutional, the remaining sections shall not be affected and shall remain in full force and effect. To this end, the provisions of this regulation are hereby declared severable.

APPENDIX B

GENERAL LAWS OF MASSACHUSETTS

GENERAL LAWS OF MASSACHUSETTS

PART I.
ADMINISTRATION OF THE GOVERNMENT

TITLE XVI.
PUBLIC HEALTH

CHAPTER 111. PUBLIC HEALTH

DUTIES OF THE DEPARTMENT OF PUBLIC HEALTH
Chapter 111: Section 5S Public bathing waters; minimum sanitation standards; testing, monitoring and analysis; regulations

Section 5S. (a) As used in this section, the following words shall have the following meanings:--

""Bathing water", fresh or salt water adjacent to any public bathing beach or semi-public bathing beach in the commonwealth.

""Department", the department of public health.

""Public bathing beach", a beach open to the general public, whether or not an entry fee is charged, that permits access to bathing waters.

""Semi-public bathing beach", a bathing beach used in connection with a hotel, motel, trailer park, campground, apartment house, condominium, country club, youth club, school, camp or similar establishment where the primary purpose of the establishment is not the operation of the bathing beach, and where admission to the use of the bathing beach is included in the fee paid for use of the premises. A semi-public bathing beach shall also include a bathing beach operated and maintained solely for the use of members and guests of an organization that maintains such a bathing beach.

(b) The department, in consultation with local health officers, shall establish minimum sanitation standards to protect bathing waters from contamination from the following: (1) sludge deposits and solid refuse; (2) floating solid, grease or scum wastes; (3) oil, hazardous material, and heavy metals; and (4) bacteria, including but not limited to, total coliform, fecal coliform and enterococci bacteria.

(c) Such standards shall establish safe levels of human exposure to such contaminants, and shall further incorporate, at a minimum, the following provisions:--

(1) An officer or an agent of a local board of health shall test, monitor and analyze all bathing waters within its municipality. Every local board of health shall report the results from all testing, monitoring and analysis of bathing waters to the department. The department shall establish such reporting requirements and shall keep public

records thereof. The department shall issue an annual report on the state of beach water quality using data that has been reported to the department. The department shall make such data available to the public upon written request.

(2) The department shall determine at which sites to conduct testing and monitoring of bathing waters. The department shall consider, but not be limited to, the following factors in determining at which sites to conduct testing and monitoring of bathing waters: (i) prior testing results pursuant to this section for such bathing waters; (ii) the number of people who use the bathing beach annually; and (iii) whether the beach is located adjacent to a storm water drain, sewage, industrial and commercial wastewater discharges, or commercial, industrial and agricultural drains.

(d) The department shall determine at what frequency to conduct testing, monitoring and analysis of bathing waters. Testing, monitoring and analysis shall be conducted on at least a weekly basis during the bathing season, and at such times and under such conditions as shall be sufficient to protect public health and safety. The department may grant a variance from the weekly testing requirement for a public or semi-public bathing beach only where there is a documented history of no sources of pollution, both point and non-point, at the bathing beach, or where such pollution sources at the beach have been fully and completely remediated.

(e) The department shall require the posting of conspicuous warning signs to notify the public whenever there is a threat to human health or safety in bathing waters. Signs shall be posted at locations on the beach that are visible to the public in order to inform the public of the nature of the problem and the possibility of a threat to human health and safety. Signs shall be posted immediately after significant rainstorms at bathing beach locations where there has been a chronic history of violations of the department's minimum sanitation standards for bathing beaches after such rainstorms. When an officer or agent of a local board of health discovers a violation of such minimum sanitation standards, the officer or agent shall notify the department immediately, and in no event not later than 24 hours after such discovery. The local board of health shall also post signs immediately, and in no event not later than 24 hours after such a discovery.

(f) A person may request that a local board of health conduct testing, monitoring and analysis of bathing waters when there is a reasonable basis to believe that an alleged violation of such minimum sanitation standards established by this section has occurred. Local boards of health shall promptly review such requests and determine whether any such testing, monitoring and analysis is necessary to ensure the public health and safety in bathing waters.

(g) The owners of semi-public bathing beaches shall be required to pay for the costs of testing, monitoring and analysis of bathing waters adjacent to such semi-public bathing beaches.

(h) Local boards of health may enter into contractual agreements with owners of semi-public bathing beaches where the local board of health conducts testing, monitoring and analysis of such bathing waters.

(i) A municipality or state agency may adopt sanitation standards and testing, monitoring, and analysis requirements for bathing waters within its jurisdiction that are stricter than the standards adopted by the department. In any case where a municipality or state agency adopts such stricter standards, any warning signs required by this section shall display the results of such stricter standards relative to the standards of the department.

(j) The testing, monitoring and analysis of bathing waters that are under the control of any state agency shall be conducted by that state agency. All such state agencies shall meet the requirements set forth by this section and the regulations promulgated by the department.

(k) The department may, subject to appropriation, award competitive grants to local boards of health in the form of a 50 per cent reimbursement for the testing, monitoring and analysis of bathing waters and to otherwise carry out the provisions of this section and the regulations promulgated there under. The department shall enter into a contractual agreement with a sole provider of testing services to be utilized by any state agency, and which may be utilized by any local board of health, to comply with the provisions of this section.

The department shall also ensure that the provisions of this section and the regulations promulgated there under are implemented in a cost effective manner by encouraging, where possible, regional approaches or other cost effective means of carrying out the purposes of this section.

(l) The department shall enforce the provisions of this section in accordance with the penalty and enforcement provisions of section 127A.

APPENDIX C

MASSACHUSETTS' BEACH ACT

CHAPTER 248 OF THE ACTS OF 2000

AN ACT RELATIVE TO MINIMUM STANDARDS FOR PUBLIC BATHING WATERS.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Chapter 111 of the General Laws is hereby amended by inserting after section 5R the following section:-

Section 5S. (a) As used in this section, the following words shall have the following meanings:-

"Bathing water", fresh or salt water adjacent to any public bathing beach or semi-public bathing beach in the commonwealth.

"Department", the department of public health.

"Public bathing beach", a beach open to the general public, whether or not an entry fee is charged, that permits access to bathing waters.

"Semi-public bathing beach", a bathing beach used in connection with a hotel, motel, trailer park, campground, apartment house, condominium, country club, youth club, school, camp or similar establishment where the primary purpose of the establishment is not the operation of the bathing beach, and where admission to the use of the bathing beach is included in the fee paid for use of the premises. A semi-public bathing beach shall also include a bathing beach operated and maintained solely for the use of members and guests of an organization that maintains such a bathing beach.

(b) The department, in consultation with local health officers, shall establish minimum sanitation standards to protect bathing waters from contamination from the following: (1) sludge deposits and solid refuse; (2) floating solid, grease or scum wastes; (3) oil, hazardous material, and heavy metals; and (4) bacteria, including but not limited to, total coliform, fecal coliform and enterococci bacteria.

(c) Such standards shall establish safe levels of human exposure to such contaminants, and shall further incorporate, at a minimum, the following provisions:-

(1) An officer or an agent of a local board of health shall test, monitor and analyze all bathing waters within its municipality. Every local board of health shall report the results from all testing, monitoring and analysis of bathing waters to the department. The department shall establish such reporting requirements and shall keep public records thereof. The department shall issue an annual report on the state of beach

water quality using data that has been reported to the department. The department shall make such data available to the public upon written request.

(2) The department shall determine at which sites to conduct testing and monitoring of bathing waters. The department shall consider, but not be limited to, the following factors in determining at which sites to conduct testing and monitoring of bathing waters: (i) prior testing results pursuant to this section for such bathing waters; (ii) the number of people who use the bathing beach annually; and (iii) whether the beach is located adjacent to a storm water drain, sewage, industrial and commercial wastewater discharges, or commercial, industrial and agricultural drains.

(d) The department shall determine at what frequency to conduct testing, monitoring and analysis of bathing waters. Testing, monitoring and analysis shall be conducted on at least a weekly basis during the bathing season, and at such times and under such conditions as shall be sufficient to protect public health and safety. The department may grant a variance from the weekly testing requirement for a public or semi-public bathing beach only where there is a documented history of no sources of pollution, both point and non-point, at the bathing beach, or where such pollution sources at the beach have been fully and completely remediated.

(e) The department shall require the posting of conspicuous warning signs to notify the public whenever there is a threat to human health or safety in bathing waters. Signs shall be posted at locations on the beach that are visible to the public in order to inform the public of the nature of the problem and the possibility of a threat to human health and safety. Signs shall be posted immediately after significant rainstorms at bathing beach locations where there has been a chronic history of violations of the department's minimum sanitation standards for bathing beaches after such rainstorms. When an officer or agent of a local board of health discovers a violation of such minimum sanitation standards, the officer or agent shall notify the department immediately, and in no event not later than 24 hours after such discovery. The local board of health shall also post signs immediately, and in no event not later than 24 hours after such a discovery.

(f) A person may request that a local board of health conduct testing, monitoring and analysis of bathing waters when there is a reasonable basis to believe that an alleged violation of such minimum sanitation standards established by this section has occurred. Local boards of health shall promptly review such requests and determine whether any such testing, monitoring and analysis is necessary to ensure the public health and safety in bathing waters.

(g) The owners of semi-public bathing beaches shall be required to pay for the costs of testing, monitoring and analysis of bathing waters adjacent to such semi-public bathing beaches.

(h) Local boards of health may enter into contractual agreements with owners of semi-public bathing beaches where the local board of health conducts testing, monitoring and analysis of such bathing waters.

(i) A municipality or state agency may adopt sanitation standards and testing, monitoring, and analysis requirements for bathing waters within its jurisdiction that are stricter than the standards adopted by the department. In any case where a municipality or state agency adopts such stricter standards, any warning signs required by this section shall display the results of such stricter standards relative to the standards of the department.

(j) The testing, monitoring and analysis of bathing waters that are under the control of any state agency shall be conducted by that state agency. All such state agencies shall meet the requirements set forth by this section and the regulations promulgated by the department.

(k) The department may, subject to appropriation, award competitive grants to local boards of health in the form of a 50 per cent reimbursement for the testing, monitoring and analysis of bathing waters and to otherwise carry out the provisions of this section and the regulations promulgated there under. The department shall enter into a contractual agreement with a sole provider of testing services to be utilized by any state agency, and which may be utilized by any local board of health, to comply with the provisions of this section.
The department shall also ensure that the provisions of this section and the regulations promulgated there under are implemented in a cost effective manner by encouraging, where possible, regional approaches or other cost effective means of carrying out the purposes of this section.

(l) The department shall enforce the provisions of this section in accordance with the penalty and enforcement provisions of section 127A.

SECTION 2. The department of public health shall promulgate the regulations required by section 5S of chapter 111 of the General Laws not later than March 1, 2001.

SECTION 3. The division of local mandates, in the office of the state auditor, through the legislative review program, pursuant to the last paragraph of section 6B of chapter 11 of the General Laws, shall make a comprehensive report on sections 1 and 2 of this act. The report shall determine the financial impact on cities and towns of such sections and shall prepare a preliminary cost study and cost benefit analysis. The report shall be filed with the clerk of the House of Representatives not later than December 1, 2000.

SECTION 4. Sections 1 and 2 of this act shall take effect on February 1, 2001.

Approved August 11, 2000.

APPENDIX D

FEDERAL BEACH ACT

PUBLIC LAW 106-284 - 0CT. 10, 2000

BEACHES ENVIRONMENTAL ASSESSMENT AND COASTAL HEALTH ACT OF 2000

Public Law 106-284
106th Congress

1. An Act

OCT. 10, 2000

[H.R.999]

To amend the Federal Water Pollution Control Act to improve the quality of coastal recreation waters, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Beaches Environmental Assessment and Coastal Health Act of 2000.
lnter-governmental relations.
Public health and Safety.
33 USC 1251 note.

SECTION I. SHORT TITLE.

This Act may be cited as the "Beaches Environmental Assessment and Coastal Health Act of 2000".

SEC. 2. ADOPTION OF COASTAL RECREATION WATER QUALITY CR1TERIA AND STANDARDS BY STATES.

Section 303 of the Federal Water Pollution Control Act (33 U.S.C. 1313) is amended by adding at the end the following:

"(i) COASTAL RECREATION WATER QUALITY CRITERIA.-

"(1) ADOPTION BY STATES.-

"(A) INITIAL CRITERIA AND STANDARDS.-Not later than 42 months after the date of the enactment of this sub- section, each State having coastal recreation waters shall adopt and submit to the Administrator water quality criteria and standards for the coastal recreation waters of the State for those pathogens and pathogen indicators for which the Administrator has published criteria under section 304(a).

"(B) NEW OR REVISED CRITERIA AND STANDARDS.-Not later than 36 months after the date of publication by the Administrator of new or revised water quality criteria under section 304(a)(9), each State having coastal recreation waters shall adopt and submit to the Administrator new or revised water quality standards for the coastal recreation waters of the State for all pathogens and pathogen indicators to which the new or revised water quality criteria are applicable.

"(2) FAILURE OF STATES TO ADOPT.-

"(A) IN GENERAL.-If a State fails to adopt water quality criteria and standards in accordance with paragraph (1)(A) that are as protective of human health as the criteria for pathogens and pathogen indicators for coastal recreation waters published by the Administrator, the Administrator shall promptly propose regulations for the State setting forth revised or new water quality standards for pathogens and pathogen indicators described in paragraph (1)(A) for coastal recreation waters of the State.

"(B) EXCEPTION.-If the Administrator proposes regulations for a State described in subparagraph (A) under sub- section (c)(4)(B), the Administrator shall publish any revised or new standard under this subsection not later than 42 months after the date of the enactment of this subsection. Publication.

"(3) APPLICABILITY.-Except as expressly provided by this subsection, the requirements and procedures of subsection (c) apply to this subsection, including the requirement in sub- section (c)(2)(A) that the criteria protect public health and welfare.".

SEC. 3. REVISIONS TO WATER QUALITY CRITERIA.

(a) STUDIES CONCERNING PATHOGEN INDICATORS IN COASTAL RECREATION WATERS.-Section 104 of the Federal Water Pollution Control Act (33 U.S.C. 1254) is amended by adding at the end the following:

"(v) STUDIES CONCERNING PATHOGEN INDICATORS IN COASTAL RECREATION W ATERS.-Not later than 18 months after the date of the enactment of this subsection, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), the Administrator shall initiate, and, not later than 3 years after the date of the enactment of this subsection, shall complete, in cooperation with the heads of other Federal agencies, studies to provide additional information for use in developing- Deadlines.

"(1) an assessment of potential human health risks resulting from exposure to pathogens in coastal recreation waters, including nongastrointestinal effects;

"(2) appropriate and effective indicators for improving detection in a timely manner in coastal recreation waters of the presence of pathogens that are harmful to human health;

"(3) appropriate, accurate, expeditious, and cost-effective methods (including predictive models) for detecting in a timely manner in coastal recreation waters the presence of pathogens that are harmful to human health; and

"(4) guidance for State application of the criteria for pathogens and pathogen indicators to be published under section 304(a)(9) to account for the diversity of geographic and aquatic conditions.".

(b) REVISED CRITERIA.-Section 304(a) of the Federal Water Pollution Control Act (33 U.S.C. 1314(a)) is amended by adding at the end the following:

"(9) REVISED CRITERIA FOR COASTAL RECREATION WATERS.- Deadlines.

"(A) IN GENERAL.-Not later than 5 years after the date of the enactment of this paragraph, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), the Administrator shall publish new or revised water quality criteria for pathogens and pathogen indicators (including a revised list of testing methods, as appropriate), based on the results of the studies conducted under section 104(v), for the purpose of protecting human health in coastal recreation waters. Publication.

"(B) REVIEWS.-Not later than the date that is 5 years after the date of publication of water quality criteria under this paragraph, and at least once every 5 years thereafter,

the Administrator shall review and, as necessary , revise the water quality criteria.".

SEC. 4. COASTAL RECREATION WATER QUALITY MONITORING AND NOTIFICATION.

Title IV of the Federal Water Pollution Control Act (33 U.S.C. 1341 et seq.) is amended by adding at the end the following:

33 USC 1346.

406. COASTAL RECREATION WATER QUALITY MONITORING AND NOTIFICATION.

Deadline.
Publication.

"(a) MONITORING AND NOTIFICATION.-

"(1) IN GENERAL.-Not later than 18 months after the date of the enactment of this section, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), and after providing public notice and an opportunity for comment, the Administrator shall publish performance criteria for-

"(A) monitoring and assessment (including specifying available methods for monitoring) of coastal recreation waters adjacent to beaches or similar points of access that are used by the public for attainment of applicable water quality standards for pathogens and pathogen indicators; and

"(B) the prompt notification of the public, local governments, and the Administrator of any exceeding of or likelihood of exceeding applicable water quality standards for coastal recreation waters described in subparagraph (A).

"(2) LEVEL OF PROTECTION.-The performance criteria referred to in paragraph (1) shall provide that the activities described in subparagraphs (A) and (B) of that paragraph shall be carried out as necessary for the protection of public health and safety.

"(b) PROGRAM DEVELOPMENT AND IMPLEMENTATION GRANTS.-

"(1) IN GENERAL.-The Administrator may make grants to States and local governments to develop and implement programs for monitoring and notification for coastal recreation waters adjacent to beaches or similar points of access that are used by the public.

"(2) LIMITATIONS.-

"(A) IN GENERAL.-The Administrator may award a grant to a State or a local government to implement a monitoring and notification program if-

"(i) the program is consistent with the performance criteria published by the Administrator under sub- section (a);

"(ii) the State or local government prioritizes the use of grant funds for particular coastal recreation waters based on the use of the water and the risk to human health presented by pathogens or pathogen indicators;

"(iii) the State or local government makes available to the Administrator the factors used to prioritize the use of funds under clause (ii);

"(iv) the State or local government provides a list of discrete areas of coastal recreation waters that are subject to the program for monitoring and notification for which the grant is provided that specifies any coastal recreation waters for which fiscal constraints

will prevent consistency with the performance criteria under subsection (a); and

"(v) the public is provided an opportunity to review the program through a process that provides for public notice and an opportunity for comment.

"(B) GRANTS TO LOCAL GOVERNMENTS.-The Administrator may make a grant to a local government under this subsection for implementation of a monitoring and notification program only if, after the l-year period beginning on the date of publication of performance criteria under subsection (a)(I), the Administrator determines that the State is not implementing a program that meets the requirements of this subsection, regardless of whether the State has received a grant under this subsection.

"(3) OTHER REQUIREMENTS.-

"(A) REPORT.-A State recipient of a grant under this subsection shall submit to +the Administrator, in such for- mat and at such intervals as the Administrator determines to be appropriate, a report that describes-

"(i) data collected as part of the program for monitoring and notification as described in subsection (c); and

"(ii) actions taken to notify the public when water quality standards are exceeded.

"(B) DELEGATION.-A State recipient of a grant under this subsection shall identify each local government to which the State has delegated or intends to delegate responsibility for implementing a monitoring and notification program consistent with the performance criteria published under subsection (a) (including any coastal recreation waters for which the authority to implement a monitoring and notification program would be subject to the delegation).

"(4) FEDERAL SHARE.-

"(A) IN GENERAL.-The Administrator, through grants awarded under this section, may pay up to 100 percent of the costs of developing and implementing a program for monitoring and notification under this subsection.

"(B) NON-FEDERAL SHARE.-The non-Federal share of the costs of developing and implementing a monitoring and notification program may be-

"(i) in an amount not to exceed 50 percent, as determined by the Administrator in consultation with State, tribal, and local government representatives; and

"(ii) provided in cash or in kind.

"(c) CONTENT OF STATE AND LOCAL GOVERNMENT PROGRAMS.-As a condition of receipt of a grant under subsection (b), a State or local government program for monitoring and notification under this section shall identify-

"(1) lists of coastal recreation waters in the State, including coastal recreation waters adjacent to beaches or similar points of access that are used by the public;

"(2) in the case of a State program for monitoring and notification, the process by which the State may delegate to local governments responsibility for implementing the monitoring and notification program;

"(3) the frequency and location of monitoring and assess- ment of coastal recreation waters based on-

"(A) the periods of recreational use of the waters;

"(B) the nature and extent of use during certain periods;

"(C) the proximity of the waters to known point sources and nonpoint sources of pollution; and

"(D) any effect of storm events on the waters;

"(4)(A) the methods to be used for detecting levels of patho- gens and pathogen indicators that are harmful to human health; and

"(B) the assessment procedures for identifying short-term increases in pathogens and pathogen indicators that are harm- ful to human health in coastal recreation waters (including increases in relation to storm events);

"(5) measures for prompt communication of the occurrence, nature, location, pollutants involved, and extent of any exceeding of, or likelihood of exceeding, applicable water quality standards for pathogens and pathogen indicators to--

"(A) the Administrator, in such form as the Administrator determines to be appropriate; and

"(B) a designated official of a local government having jurisdiction over land adjoining the coastal recreation waters for which the failure to meet applicable standards is identified;

"(6) measures for the posting of signs at beaches or similar points of access, or functionally equivalent communication measures that are sufficient to give notice to the public that the coastal recreation waters are not meeting or are not expected to meet applicable water quality standards for pathogens and pathogen indicators; and

"(7) measures that inform the public of the potential risks associated with water contact activities in the coastal recreation waters that do not meet applicable water quality standards.

Deadline.

"(d) FEDERAL AGENCY PROGRAMS.-Not later than 3 years after the date of the enactment of this section, each Federal agency that has jurisdiction over coastal recreation waters adjacent to beaches or similar points of access that are used by the public shall develop and implement, through a process that provides for public notice and an opportunity for comment, a monitoring and notification program for the coastal recreation waters that-

"(1) protects the public health and safety;

"(2) is consistent with the performance criteria published under subsection (a);

Reports.

"(3) includes a completed report on the information specified in subsection (b)(3)(A), to be submitted to the Administrator; and

"(4) addresses the matters specified in subsection (c) .

Public Information.

"(e) DATABASE.-The Administrator shall establish, maintain, and make available to the public by electronic and other means a national coastal recreation water pollution occurrence database that provides-

"(1) the data reported to the Administrator under sub- sections (b)(3)(A)(i) and (d)(3); and

"(2) other information concerning pathogens and pathogen indicators in coastal recreation waters that-

"(A) is made available to the Administrator by a State or local government, from a coastal water quality monitoring program of the State or local government; and

"(B) the Administrator determines should be included.

"(f) TECHNICAL ASSISTANCE FOR MONITORING FLOATABLE MATERIAL.-The Administrator shall provide technical assistance to States and local governments for the development of assessment and monitoring procedures for floatable material to protect public health and safety in coastal recreation waters.

"(g) LIST OF WATERS.-

"(1) IN GENERAL.-Beginning not later than 18 months Deadline. after the date of publication of performance criteria under subsection (a), based on information made available to the Administrator, the Administrator shall identify , and maintain a list of, discrete coastal recreation waters adjacent to beaches or similar points of access that are used by the public that- Deadline.

"(A) specifies any waters described in this paragraph that are subject to a monitoring and notification program consistent with the performance criteria established under subsection (a); and

"(B) specifies any waters described in this paragraph for which there is no monitoring and notification program (including waters for which fiscal constraints will prevent the State or the Administrator from performing monitoring and notification consistent with the performance criteria established under subsection (a)).

"(2) AVAILABILITY.-The Administrator shall make the list Public described in paragraph (1) available to the public through- information. Public Information .

"(A) publication in the Federal Register; and Federal Register

"(B) electronic media. publication. Federal Register, Publication.

"(3) UPDATES.-The Administrator shall update the list described in paragraph (1) periodically as new information becomes available.

"(h) USEPA IMPLEMENTATION.-In the case of a State that has no program for monitoring and notification that is consistent with the performance criteria published under subsection (a) after the last day of the 3-year period beginning on the date on which the Administrator lists waters in the State under subsection (g)(I)(B), the Administrator shall conduct a monitoring and notification program for the listed waters based on a priority ranking established by the Administrator using funds appropriated for grants under subsection (i)-

"(1) to conduct monitoring and notification; and

"(2) for related salaries, expenses, and travel.

"(i) AUTHORIZATION OF APPROPRIATIONS.- There is authorized to be appropriated for making grants under subsection (b), including implementation of monitoring and notification programs by the Administrator under subsection (h), $30,000,000 for each of fiscal years 2001 through 2005.".

SEC. 5. DEFINITIONS.

Section 502 of the Federal Water Pollution Control Act (33 U.S.C. 1362) is amended by adding at the end the following:

"(21) COASTAL RECREATION WATERS.-

"(A) IN GENERAL.-The term 'coastal recreation waters' means-

"(i) the Great Lakes; and

"(ii) marine coastal waters (including coastal estuaries) that are designated under section 303(c) by a State for use for swimming, bathing, surfing, or similar water contact activities.

"(B) EXCLUSIONS.- The term 'coastal recreation waters' does not include-

"(i) inland waters; or

"(ii) waters upstream of the mouth of a river or stream having an unimpaired natural connection with the open sea.

"(22) FLOATABLE MATERIAL.-

"(A) IN GENERAL.- The term 'floatable material' means any foreign matter that may float or remain suspended in the water column.

"(B) INCLUSIONS.-The term 'floatable material' includes-

"(i) plastic;

"(ii) aluminum cans;

"(iii) wood products;

“(iv) bottles; and

"(v) paper products.

"(23) PATHOGEN INDICATOR.-The term 'pathogen indicator' means a substance that indicates the potential for human infectious disease.".

SEC. 6. INDIAN TRIBES.

Section 518(e) of the Federal Water Pollution Control Act (33 U.S.C. 1377(e)) is amended by striking "and 404" and inserting "404, and 406".

33 USC 1375a.
Deadline.

SEC. 7. REPORT.

(a) IN GENERAL.-Not later than 4 years after the date of the enactment of this Act, and every 4 years thereafter, the Administrator of the Environmental Protection Agency shall submit to Congress a report that includes-

(1) recommendations concerning the need for additional water quality criteria for pathogens and pathogen indicators and other actions that should be taken to improve the quality of coastal recreation waters;

(2) an evaluation of Federal, State, and local efforts to implement this Act, including the amendments made by this Act; and

(3) recommendations on improvements to methodologies and techniques for monitoring of coastal recreation waters. (b) COORDINATION.-The Administrator of the Environmental Protection Agency may coordinate the report under this section with other reporting requirements under the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.).

SEC. 8. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to carry out the provisions of this Act, including the amendments made by this Act, for which amounts are not otherwise specifically authorized to be appropriated, such sums as are necessary for each of fiscal years 2001 through 2005.

Approved October 10, 2000

LEGISLATIVE HISTORY-H.R. 999 (S. 522):

HOUSE REPORTS: No.106-98 (Comm. on Transportation and Infrastructure).

SENATE REPORTS: No.106-366 accompanying S. 522 (Comm. on Environment and Public Works).

CONGRESSIONAL RECORD:

Vol. 145 (1999): Apr. 22, considered and passed House.

Vol. 146 (2000): Sept. 21, considered and passed Senate, amended. Sept. 26, House concurred in Senate amendment.

WEEKLY COMPILATION OF PRESENTIAL DOCUMENTS, Vol. 36 (2000):

Oct. 10, Presidential statement.

APPENDIX E

MDPH BEACH SAMPLING DATA FORM

Beach Sampling Field Data Form

Town/City of Collection: **Date Collected:** **Collected By:**	**Time Delivered to Lab:** **Delivered By:** **Relinquished To:**

Instructions: Collect sample(s) in areas of greatest bather load and at locations subject to contamination at a uniform depth of 3 feet. Collect samples 12 inches below water surface. Do not collect samples within 6 inches of bottom.

Sample ID	Sample Location (Note beach and sampling location)	Marine or Fresh	Sample Time	Water Clarity	Water Temp (°F)	Days Since Rain ('0' if w/in 24 hrs.)	Bather Density (in water) (Circle appropriate # range)				Observations of bathing water
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	
				Clear Cloudy/Murky			0-10	11-20	20-50	>50	

Observations: **T=**Trash **WS**=Waste Solids **SD**=Sludge Deposit **O**=Oils **A**=Algae **F**=Fish die-offs **J**=Jellyfish **B**=Birds **D**=Dogs **N**=None

Current Weather Condition: **C**loudy/Overcast **S**unny **R**ainy **F**oggy **W**indy **Air Temp:** _______**°F** **Wind Direction:** _______

Comments: ____

____

____

Please Note: This form MUST be utilized upon collection of samples and filled out in its entirety. For reporting purposes, a copy must be submitted to MDPH with any lab results.